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# Report to the Legislature

Montana Department of Natural Resources and Conservation

January  
1995

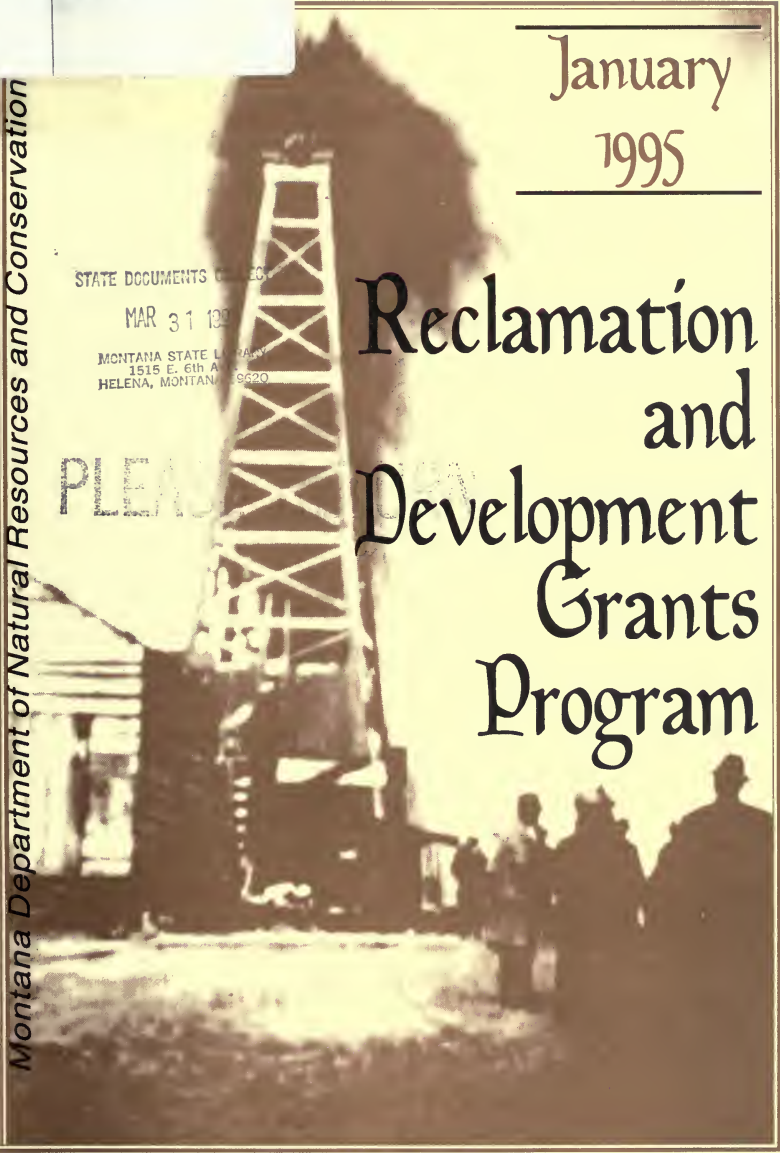
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## Reclamation and Development Grants Program



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**RECLAMATION AND DEVELOPMENT GRANTS PROGRAM**  
**REPORT TO THE LEGISLATURE**

**Projects Proposed for the 1997 Biennium**  
**and**  
**Status Report of 1987-1993 Projects**

**January 1995**

**Montana Department of Natural Resources and Conservation**  
**Conservation and Resource Development Division**  
**1520 East Sixth Avenue**  
**P.O. Box 202301**  
**Helena, Montana 59620-2301**

## ABBREVIATIONS

AMD	acid mine drainage
AMHMI	Abandoned Mines Hazardous Materials Inventory
ARCO	Atlantic Richfield Company
ASCS	Agricultural Stabilization and Conservation Service, U.S. Department of Agriculture
BLM	Bureau of Land Management, U.S. Department of the Interior
BMP	best management practice
BOGC	Montana Board of Oil and Gas Conservation
CARDD	Conservation and Resource Development Division
CD	conservation district
CDB	Conservation Districts Bureau, Montana Department of Natural Resources and Conservation
Co.	county
CTR	Clean Tailings Reclamation
DFWP	Montana Department of Fish, Wildlife and Parks
DHES	Montana Department of Health and Environmental Sciences
DNRC	Montana Department of Natural Resources and Conservation
DSL	Montana Department of State Lands
EA	environmental assessment
EPA	U.S. Environmental Protection Agency
Fe	Iron
FTE	full-time employee
FY	Fiscal Year
GIS	Geographic Information System
GPD	gallons per day
gpm	gallons per minute
LIS	Land Information System
MBMG	Montana Bureau of Mines and Geology
MCA	<i>Montana Code Annotated</i>
MDDA	Montana Department of Agriculture
Montana	
Tech	Montana Tech of the University of Montana
MSCA	Montana Salinity Control Association
MSU	Montana State University
NPS	nonpoint source
OSM	Office of Surface Mining, U.S. Department of the Interior
PMC	Plant Materials Center
ppm	parts per million
PVC	Polyvinyl chloride
RC&D	Resource Conservation and Development Area
RDGP	Reclamation and Development Grants Program
RIT	Resource Indemnity Trust
RRU	Reclamation Research Unit
SCS	Soil Conservation Service, U.S. Department of Agriculture
USBM	Bureau of Mines, U.S. Department of the Interior
USBR	Bureau of Reclamation, U.S. Department of the Interior
USDA	U.S. Department of Agriculture
USFS	Forest Service, U.S. Department of Agriculture
USGS	Geological Survey, U.S. Department of the Interior
WASTEC	Water, Air, and Soils Testing and Evaluation Center
WQA	Water Quality Act
WSCT	westslope cutthroat

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This appendix is available upon request from the Department of Natural Resources and Conservation, Conservation and Resource Development Division

**INDEX OF PROJECTS SUBMITTED FOR FUNDING IN THE**  
**1997 BIENNIUM**

Following is a list of projects submitted for funding in the 1997 biennium. For easy reference, the list is alphabetized by the names of the project sponsors. However, in Chapter II the project summaries and recommendations are presented in the order of their ranking by the Department of Natural Resources and Conservation.

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**PROGRAM DESCRIPTION AND PROCEDURES**

**Program Information**

The Reclamation and Development Grants Program (RDGP) is a state-funded grant program designed to fund projects that *"indemnify the people of the state for the effects of mineral development on public resources and that meet other crucial state needs serving the public interest and the total environment of the citizens of Montana"* (Section 90-2-1102, MCA). The program, established by the 1987 Montana Legislature, is administered by the Montana Department of Natural Resources and Conservation (DNRC).

In February 1994, DNRC mailed application materials to all Montana communities, counties, the university system, conservation districts, state agencies, state legislators, and others who might benefit by program participation. The application deadline was May 15, 1994. DNRC received 25 applications for RDGP funding totaling nearly \$5.2 million.

The funding source for this program is the interest income from the Resource Indemnity Trust (RIT) fund. This fund, established by Section 15-38-201, MCA, receives proceeds from taxes levied on mineral production. During state fiscal years 1986 through 1995, 105 projects totaling more than \$18 million have been authorized for funding. The 1993 Montana Legislature directed that, beginning in state fiscal year 1996, a minimum of \$3 million be allocated for grants in the 1997 biennium.

The Reclamation and Development Grants Program Act requires that the governor submit, by the first day of each regular session of the legislature, a list of all grant proposals received with his or her recommended priorities for funding. Administrative rules further provide that DNRC must furnish to the legislature a status report on previously funded projects. This report is the result of those directives.

**Project Eligibility**

The following excerpts from the Reclamation and Development Grants Program Act (Section 90-2-1112, MCA) establish criteria that projects must meet in order to be eligible for funding.

- (1) *Except as provided under subsection (2), to be eligible for funding under the Reclamation and Development Grants Program, the proposed project must provide benefits in one or more of the following categories:*
  - (a) *reclamation of land, water, or other resources adversely affected by mineral development;*
  - (b) *mitigation of damage to public resources caused by mineral development;*

- (c) *research, demonstration, or technical assistance to promote the wise use of Montana minerals, including efforts to make processing more environmentally compatible;*
  - (d) *investigation and remediation of sites where hazardous wastes or regulated substances threaten public health or the environment; and*
  - (e) *research to assess existing or potential environmental damage resulting from mineral development.*
- (2) *If sufficient eligible and qualified applications satisfying the mineral development objectives provided for in subsection (1) are not received or if there is a crucial state need, the department [DNRC] may evaluate and the governor may recommend that the legislature approve funding for projects that:*
- (a) *enhance Montana's economy through the development of natural resources; or*
  - (b) *develop, promote, protect, or further Montana's total environment and public interest, including the general health, safety, welfare, and public resources of Montana citizens and communities.*

#### **Applicant Eligibility**

Any department, agency, board, commission, or other division of state government or any city, county, or other political subdivision or tribal government within the state may apply for a grant from the Reclamation and Development Grants Program.

#### **Funding Limits**

No grant may exceed \$300,000. An applicant proposing more than one project may submit a separate application for each. There is no minimum funding limit.

#### **Application Review And Ranking Procedures**

The grant applications were evaluated for the proposed projects' technical and financial feasibility, public benefits to be provided, need and urgency, and impacts on the environment. Reviewers included staff members of the department's Resource Development, Facility Siting, Conservation Districts, and Water Management bureaus, with assistance from federal, state, and university personnel having expertise in specific project areas. For each application, a descriptive project summary was written incorporating the concerns, ideas, and comments of the project reviewers; those summaries appear in the Appendix to this report. A less detailed description of each proposed project can be found in Chapter II.

More funds are requested than are available. Therefore, the department ranks feasible projects, so that it can recommend funding priority and funding level to the governor. Evaluation criteria established by the 1987 legislature include, but are not limited to:

1. The degree to which the project will provide benefits in its eligibility category or categories
2. The degree to which the project will provide public benefits
3. The degree to which the project will promote, enhance, or advance the policies and purposes of the Reclamation and Development Grants Program
4. The degree to which the project will provide for the conservation of natural resources
5. The degree of need and urgency for the project
6. The extent to which the project sponsor or local entity is contributing to the costs of the project or is generating additional nonstate funds
7. The degree to which jobs are created for persons who need job training, receive public assistance, or are chronically unemployed
8. Any other criteria DNRC considers necessary to carry out the policies and purposes of the Reclamation and Development Grants Program

Under the ranking system, a proposal could receive a maximum of 215 points. Specific criteria were established for each category to provide consistency. Of the following criteria, public benefits and need and urgency were weighted most heavily.

	<u>Maximum Points</u> <u>Possible</u>
1. Public Benefits	90
2. Need and Urgency	50
3. Appropriateness of Technical Design	40
4. Financial Feasibility	15
5. Project Management Organization	<u>20</u>
Total Possible Points:	215

### Recommendations

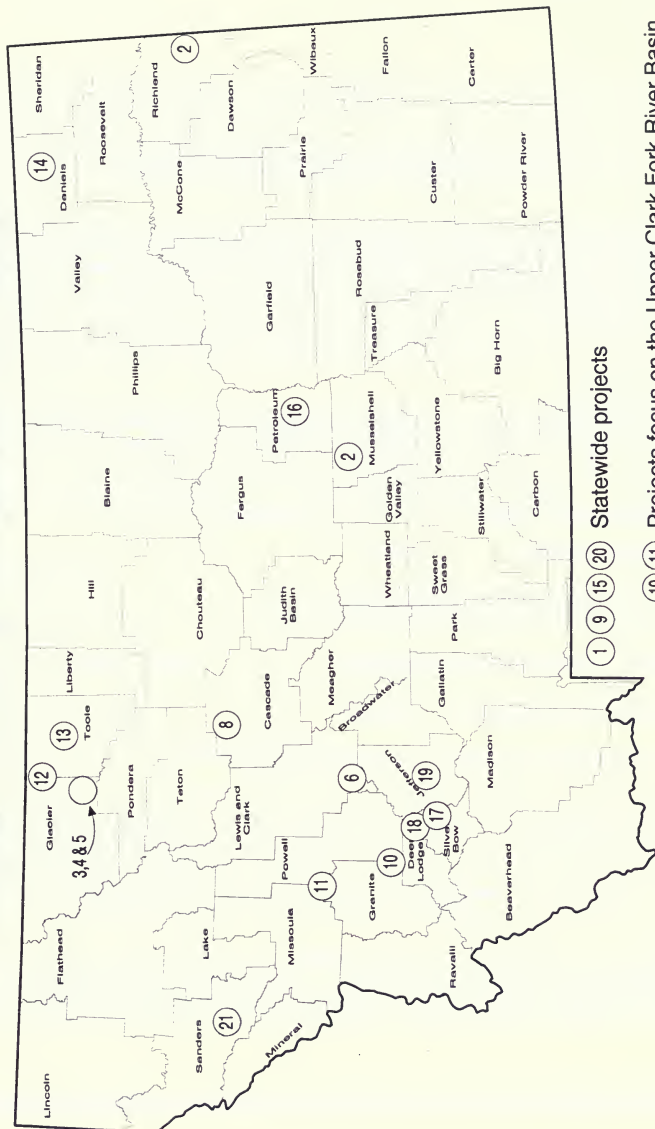
After ranking the projects and recommending funding, the Conservation and Resource Development Division made its recommendations to the DNRC director. The director then presented DNRC's recommendations to the governor. The final ranking of the proposed projects is presented in Table 1, along with funding recommendations. The locations of the 21 projects recommended for funding are shown in Figure 1.

An appropriations bill listing the governor's recommendations will be introduced to the 1995 legislature. By appropriation or other appropriate means, the legislature may approve grants for those projects it finds consistent with the policies and purposes of RDGP.

TABLE I

Project Sponsor (Project Title)	Amount Requested	Amount Recommended	Cumulative Total Recommended
1 Department of Natural Resources and Conservation (Abandoned Mine Reclamation Project)	\$300,000	\$300,000	\$300,000
2 Montana Board of Oil and Gas Conservation (Devil's Basin: Plug, Abandonment, and Restoration)	300,000	300,000	600,000
3 Montana Board of Oil and Gas Conservation (South Cut Bank Field - A: Plug, Abandonment, and Rest.)	300,000	300,000	900,000
4 Montana Board of Oil and Gas Conservation (South Cut Bank Field - B: Plug, Abandonment, and Rest.)	300,000	300,000	1,200,000
5 Department of State Lands (Oil Well Abandonment)	183,260	183,260	1,383,260
6 City of Helena/Lewis & Clark County (Tenmile Mine Site Reclamation Project)	300,000	100,000	1,483,260
7 Montana State University (Clean Tailings Reclamation)	299,039	150,000	1,633,260
8 Cascade County Conservation District (Muddy Creek Water Quality Improvement)	300,000	300,000	1,933,260
9 Department of Health and Environmental Sciences (Nonpoint Source Pollution Control)	300,000	300,000	2,233,260
10 Butte-Silver Bow Local Government (Upper Clark Fork Basin: Superfund Tech. Assist.)	93,622	93,622	2,326,882
11 Department of Health and Environmental Sciences (Superfund GIS)	241,548	171,548	2,498,430
12 Glacier County Conservation District (Comprehensive Evaluation of Groundwater, Red River)	157,424	157,424	2,655,854
13 Toole County (North Toole County Reclamation Project)	295,246	295,246	2,951,100
14 Department of State Lands (Scobey Reclamation Site)	11,000	11,000	2,962,100
15 Carbon County (Dry Hydrant Demonstration)	133,000	133,000	3,095,100
16 Petroleum County Conservation District (Petroleum County Artesian Basin Groundwater Project)	300,000	300,000	3,395,100
17 Butte-Silver Bow Local Government (Travona Mineyard Preservation and Enhancement)	248,710	168,740	3,563,840
18 Town of Walkerville (Walkerville Parks and Rec. Project)	103,200	103,200	3,667,040
19 Jefferson Valley Conservation District (Remote Mine Site Demonstration Project)	65,558	65,558	3,732,598
20 Department of State Lands (Expansion of the DSL GIS )	124,377	124,377	3,856,975
21 Eastern Sanders Conservation District (Plains Area Recreational Center - PARC)	153,600	153,600	4,010,575
Libby Area Conservancy District (Libby-Granite-Cherry Creek Flood Control Plan)	35,000	0	4,010,575
Mill High Conservation District (Accelerated Soil Survey: Silver Bow County)	282,240	0	4,010,575
Montana Tech of the University of Montana (Iron Oxidation and Transport at the Bullion Mine)	64,397	0	4,010,575
Town of Walkerville (Reclamation of the Marget Ann Claim Block)	300,000	0	4,010,575
TOTAL REQUESTS	\$5,191,221		
-- Minimum Funding for RDGP is \$3,000,000			

**FIGURE 1. RECLAMATION AND DEVELOPMENT GRANTS PROGRAM  
LOCATION OF PROJECTS RECOMMENDED FOR FUNDING**



## CHAPTER II

### **PROJECT SUMMARIES AND RECOMMENDATIONS** **FOR THE 1997 BIENNIUM**

Summaries of all projects submitted for RDGP funding, along with the amount recommended, are presented in this chapter. The summaries of projects recommended for funding appear in the order in which those projects are ranked. Not all proposals are recommended for funding; the summaries of those projects are alphabetized by the name of the applicant and presented at the end of this chapter.

#### **PROJECT NO. 1**

**APPLICANT NAME:** Montana Department of Natural Resources and  
Conservation/Conservation and Resource Development  
Division

**PROJECT/ACTIVITY NAME:** Abandoned Mine Reclamation Project

**AMOUNT REQUESTED:** \$ 300,000

**OTHER FUNDING SOURCES AND AMOUNTS:**

Applicant \$ 10,000

**TOTAL PROJECT COST:** \$ 310,000

**RECOMMENDED FUNDING:** \$ 300,000

**PROJECT ABSTRACT:** (Prepared and submitted by applicant.)

Montana contains an estimated 6,000 abandoned hard rock mining sites. This legacy of Montana's mining past has left a wide range of problems and challenges for state and federal agencies charged with their reclamation and cleanup. Many of these abandoned sites threaten human health and the environment because of mining wastes containing elevated concentrations of heavy metals and other contaminants. Although many sites are being addressed by agency enforcement actions, a still larger number are not and can be addressed by RDGP.

In January, 1992 the Department of State Lands (DSL) solicited federal/state agency assistance in the identification of suspected problem sites. A resulting list of 270 suspect sites in 23 counties throughout Montana was compiled by DSL, the Department of Natural Resources and Conservation (DNRC), the Department of Health and Environmental Sciences (DHES), the



Bureau of Land Management (BLM), and the U.S. Forest Service (USFS). DSL then used agency data bases and field investigations to conduct a comparative statewide analysis and ranking of these sites. The assimilated findings, known as the Abandoned Mines Hazardous Materials Inventory (AMHMI), represents Montana's first coordinated attempt to identify, and determine in order of contamination severity, which sites should be slated for cleanup removal actions first.

As a major participant in this collaborative state/federal prioritization and cleanup effort, DNRC's Conservation and Resource Development Division (CARDD) is requesting a minimum of \$300,000 to conduct reclamation activities at a number of the most serious sites identified in the AMHMI. CARDD's request is motivated by two principal factors, 1) public release of the AMHMI did not allow sufficient grant preparation time for affected local governments, and 2) CARDD's and the public's intent to facilitate RDGP funded mine cleanups in an effective and yet timely manner.

Immediately upon receipt of RDGP grant funds, CARDD will commence contract negotiations with a number of affected local governments to begin project implementation activities. The local entity will subcontract project design and construction cleanup. The project duration (design/construction) is expected to be two years. Monitoring activities will continue an additional 1 to 5 years depending on the nature and detail of data collected.

## **PROJECT NO. 2**

<b><u>APPLICANT NAME:</u></b>	Montana Board of Oil and Gas Conservation
<b><u>PROJECT/ACTIVITY NAME:</u></b>	Devil's Basin Plug and Abandonment and Site Restoration
<b><u>AMOUNT REQUESTED:</u></b>	\$ 300,000
<b><u>OTHER FUNDING SOURCES AND AMOUNTS:</u></b>	
Applicant	\$ 10,000
<b><u>TOTAL PROJECT COST:</u></b>	\$ 310,000
<b><u>RECOMMENDED FUNDING:</u></b>	\$ 300,000

**PROJECT ABSTRACT:** (Prepared and submitted by applicant.)

The purpose of this grant request is to provide funding to properly plug and abandon 17 orphaned oil wells in the Devil's Basin Field and two wells east of Sidney, and to perform the surface reclamation. The wells are over-pressured and several are leaking oil and water to the surface. The pressure in the wells poses a threat to the environment and other mineral

resources. These wells will continue to create surface damage and substantial groundwater contamination. The Board of Oil and Gas Conservation recommends plugging the wells as soon as possible. Plugging the wells will allow resumption of agricultural production and reduce the hazard to livestock and wildlife.

The Board of Oil and Gas Conservation will eliminate the threat of contamination to the surface, groundwater, and other mineral formations by soliciting bids to plug the wells and reclaim the surface locations using qualified oil field contractors.

The operators could no longer afford to produce the wells and the wells were shut in. The companies' assets will not cover the liabilities to creditors leaving the operators insolvent. Since the operators are currently insolvent, responsibility for the wells and any potential environmental damage rests with the Board of Oil and Gas Conservation and the State.

The orphaned wells are located in Township 10 North, Range 25 East and Township 11 North, Range 24 East in the Devil's Basin Field, 16 miles north of Roundup in Musselshell County, and Township 22 North, Range 59 East, 6 miles southeast of Sidney in Richland County.

The project is estimated to take 24 months. The work will generally begin during the first suitable field season following the availability of funding.



### **PROJECT NO. 3**

**APPLICANT NAME:** Montana Board of Oil and Gas Conservation

**PROJECT/ACTIVITY NAME:** South Cut Bank Field Plug and Abandonment and Site Restoration - "A"

**AMOUNT REQUESTED:** \$ 300,000

**OTHER FUNDING SOURCES AND AMOUNTS:**

Applicant	\$ 10,000
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**TOTAL PROJECT COST:** \$ 310,000

**RECOMMENDED FUNDING:** \$ 300,000

**PROJECT ABSTRACT:** (Prepared and submitted by applicant.)

The purpose of this grant request is to provide funding to properly plug and abandon 17 orphaned oil wells in the Cut Bank Field, and to perform surface reclamation. The wells are all in the late stages of secondary recovery (water flood projects). The formations were water flooded--water floods sweep and replace the oil with water removing most of the recoverable oil. The process leaves the wells over-pressured with the ability to flow large volumes of water. (Once the wells are shut in, the formation pressure increases, exceeding the safe operating range for the well casing and equipment.) This increase in pressure poses a threat to the environment and other mineral resources. These wells will create surface damage and substantial groundwater contamination if not plugged in the near future. Plugging the wells will allow resumption of agricultural production and reduce the hazard to livestock and wildlife.

The Board of Oil and Gas Conservation will eliminate the threat of contamination to the surface, groundwater, and other mineral formations by soliciting bids to plug the wells and reclaim the surface locations using qualified oil field contractors.

Most of these wells produced until 1992. The operators could no longer afford to produce the wells and the wells were shut in. The companies' assets will not cover the liabilities to creditors leaving the operators insolvent. Since the operators are currently insolvent, responsibility for the wells and any potential environmental damage rests with the Board of Oil and Gas Conservation and the State.

The orphaned wells are located in Township 32 North and Range 5 and 6 West in the Cut Bank Field, 6 miles south of Cut Bank in Glacier County.

The project is estimated to take 24 months. The work will generally begin during the first suitable field season following the availability of funding.

#### **PROJECT NO. 4**

**APPLICANT NAME:** Montana Board of Oil and Gas Conservation

**PROJECT/ACTIVITY NAME:** South Cut Bank Field Plug and Abandonment and Site Restoration - "B"

**AMOUNT REQUESTED:** \$ 300,000

**OTHER FUNDING SOURCES AND AMOUNTS:**

Applicant \$ 10,000

**TOTAL PROJECT COST:** \$ 310,000

**RECOMMENDED FUNDING:** \$ 300,000

**PROJECT ABSTRACT:** (Prepared and submitted by applicant.)

The purpose of this grant request is to provide funding to properly plug and abandon 21 orphaned oil wells in the Cut Bank Field, and to perform surface reclamation. The wells are all in the late stages of secondary recovery (water flood projects). The formations were water flooded--water floods sweep and replace the oil with water removing most of the recoverable oil. The process leaves the wells over pressured with the ability to flow large volumes of water. Once the wells are shut in, the formation pressure increases exceeding the safe operating range for the well casing and equipment. This increase in pressure poses a threat to the environment and other mineral resources. These wells will create surface damage and substantial groundwater contamination if not plugged in the near future. Plugging the wells will allow resumption of agricultural production and reduce the hazard to livestock and wildlife.

The Board of Oil and Gas Conservation will eliminate the threat of contamination to the surface, groundwater, and other mineral formations by soliciting bids to plug the wells and reclaim the surface locations using qualified oil field contractors.

Most of these wells produced until 1992. The operators could no longer afford to produce the wells and the wells were shut in. The companies' assets will not cover the liabilities to creditors leaving the operators insolvent. Since the operators are currently insolvent, responsibility for the wells and any potential environmental damage rests with the Board of Oil and Gas Conservation and the State.

The orphaned wells are located in Township 32 North and Range 5 and 6 West in the Cut Bank Field, 6 miles south of Cut Bank in Glacier County.

The project is estimated to take 24 months. The work will generally begin during the first suitable field season following the availability of funding.

#### **PROJECT NO. 5**

**APPLICANT NAME:** Montana Department of State Lands/Lands  
Division/Minerals Management Bureau

**PROJECT/ACTIVITY NAME:** Well Plugging and Abandonment Project

**AMOUNT REQUESTED:** \$ 183,260

**OTHER FUNDING SOURCES AND AMOUNTS:**

Applicant \$ 5,924

**TOTAL PROJECT COST:** \$ 189,184

**RECOMMENDED FUNDING:** \$ 183,260

**PROJECT ABSTRACT:** (Prepared and submitted by applicant.)

The well abandonment project will be conducted on Section 16 of Township 32 North, Range 5 West. This tract of land is located  $\approx$  9 miles south of the town of Cut Bank. Pressure buildup is occurring in oil and gas wells as a result of water flooding to the west of this state section. As a result of winter weather and excessive well pressure, lines and fittings have cracked, causing oil leakage. Three wells were abandoned last year by the BLM and Montana Board of Oil and Gas Conservation because oil escaping to the surface was draining toward Cut Bank Creek. Further, the wells in this section and within Glacier County have corrosion problems. This means that the casing is deteriorated and will allow co-mingling of water and oil. Montana statute requires the prevention of this co-mingling and preventing the contamination of aquifers and oil and gas zones. The project is intended to correct these problems and can be completed in two months time.

## PROJECT NO. 6

APPLICANT NAME: City of Helena and Lewis and Clark County Water Quality Protection District

PROJECT/ACTIVITY NAME: Tenmile Mine Site Reclamation Project

AMOUNT REQUESTED: \$ 300,000

### OTHER FUNDING SOURCES AND AMOUNTS:

City of Helena	\$ 15,066
Lewis & Clark	\$ 27,780
Water Quality Protection District	

TOTAL PROJECT COST: \$ 342,846

RECOMMENDED FUNDING: \$ 100,000

PROJECT ABSTRACT: (Prepared and submitted by applicant.)

Heavy rainfall and snowmelt during the spring and summer of 1993 caused water to back up within the Tenmile mine adit. Water pressure within the adit forced a plug "blowout," causing several hundred cubic yards of mine tailings, waste rock, mud, and debris to slide down the steep hillside, over a large section of land reclaimed by the Department of State Lands (DSL), and into Tenmile Creek. The Tenmile Water Treatment Plant stream intakes are located approximately one mile downstream from the slide area.

Besides creating turbidity during periods of high runoff, toxic and heavy metals contained in the slide materials continue to pollute Tenmile Creek. These pollutants include arsenic, lead, cadmium, and zinc. Acidic leachate from the tailings slide continues to pose an imminent threat to water and aquatic life in the creek.

Proposed project work will focus on reducing the adverse impacts to the creek from turbid and metal laden run-off or leachate originating at the site of the slide. Adverse impacts will be mitigated by a combination of source reduction and surface reclamation. Portions of the slide materials will be relocated away from the creek, erosion paths will be recontoured and stabilized, sediment traps will be constructed, and the site will be revegetated. Adit drainage controls will also be implemented to collect and re-route water that otherwise would leach and move heavy metals into Tenmile Creek.

The workplan includes a monitoring and assessment program to evaluate effectiveness of the project and collect needed data on the flow rate and chemical characteristics of the adit drainage water. If successful, this program will serve as an example for other remediation projects in the Tenmile and other Montana watersheds affected by abandoned mine sites.

## **PROJECT NO. 7**

**APPLICANT NAME:** Montana State University, Reclamation Research Unit

**PROJECT/ACTIVITY NAME:** Clean Tailings Reclamation

**AMOUNT REQUESTED:** \$ 299,039

### **OTHER FUNDING SOURCES AND AMOUNTS:**

Applicant \$ 116,625

**TOTAL PROJECT COST:** \$ 415,664

**RECOMMENDED FUNDING:** \$ 150,000

**PROJECT ABSTRACT:** (Prepared and submitted by applicant.)

The mining of metallic minerals in Montana through environmentally insensitive methods has resulted in a legacy of soil and water contamination caused by thousands of abandoned mine sites. Many mine sites contain waste materials bearing metallic contaminants such as copper, lead, zinc, and cadmium. This problem is further exacerbated by the presence of pyrite which oxidizes upon exposure to the atmosphere resulting in acid generation and mobilization of heavy metal contaminants. Since pyrite was not recovered as a mineral of economic value, it was placed in waste piles which now are the source of acid metalliferous water discharge which degrades hundreds of miles of Montana's rivers. These abandoned tailings currently lack effective, permanent, cost effective reclamation methods.

It is proposed to demonstrate a tailing reclamation methodology through the marriage of mineral processing and land reclamation techniques. The proposed Clean Tailings Reclamation (CTR) approach uses field deployable mineral separation technologies to remove sulfide mineral contaminants from tailings material, followed by vegetative stabilization of the cleaned tailings material with adapted plants. By cleaning tailings of sulfide minerals, lime application rates for neutralization of tailings acid generation will be dramatically decreased resulting in substantial cost savings over conventional reclamation approaches. It is anticipated that CTR technology will result in cost effective, permanent tailings reclamation which reduces human health and environmental risk through removal of heavy metal contaminants. This research will be conducted in two steps, an initial laboratory and greenhouse experiment and a field demonstration.

Three locations in Montana, two abandoned mine sites and an operating mine, will be selected for the initial study and a single mine site will be selected for the field demonstration.

The project will take 24 months to complete.

## **PROJECT NO. 8**

**APPLICANT NAME:** Cascade County Conservation District

**PROJECT/ACTIVITY NAME:** Muddy Creek Water Quality Improvement

**AMOUNT REQUESTED:** \$ 300,000

### **OTHER FUNDING SOURCES AND AMOUNTS:**

Applicant	\$ 6,500
Greenfield Irrigation District	\$ 100,000
U.S. Bureau of Reclamation	\$ 40,000
U.S. Soil Conservation Service	\$ 20,000
DNRC, Water Resources Division	\$ 10,000
Dept. of Health & Env. Sciences	\$ 2,000
Dept. of Fish, Wildlife, and Parks	\$ 2,000
Conservation groups	\$ 5,000
EPA 319 from existing project	\$ 10,000

**TOTAL PROJECT COST:** \$ 495,500

**RECOMMENDED FUNDING:** \$ 300,000

**PROJECT ABSTRACT:** (Prepared and submitted by applicant.)

Muddy Creek has been listed among the top five of the state's water quality problems for the last 17 years primarily due to sediment. Muddy Creek picks up substantial run-off primarily from the Greenfield Irrigation District, which, when combined with storm run-off and run-off from non-irrigated lands, contributes many times the natural flow with a heavy sediment load resulting in streambank erosion and water quality problems in Muddy Creek, Sun and Missouri rivers. This impact is seen in the 200,000 tons of sediment that is deposited into the Sun and Missouri rivers annually. The sediments have a detrimental effect on aquatic life, fisheries, recreation, aesthetics, possible flooding, water treatment costs, and irrigation costs.



There is an immediate need to reduce the sediment load into the Sun and Missouri rivers before more significant problems arise and become more costly to resolve. The proposed project also would complement existing projects being pursued in this area. This project is an action step contrasted to the 70 plus studies over a 20-year period of no action.

The goals of this project are: (1) reduce sediment delivery to the Sun and Missouri rivers, (2) reestablish riparian vegetation along Muddy Creek, and (3) improve the fisheries in the Sun River.

The objectives to reach this goal are: (1) install rock vortex weirs to stop channel headcutting; (2) work with land operators to restore the Muddy Creek riparian zone through fencing, tree plantings and prescribed grazing systems; (3) achieve goals 1 & 2, and work with the Montana Fish, Wildlife and Parks to create a productive fishery.

The organization responsible for this project is the Cascade County Conservation District.

The project area is on Muddy Creek on the property of Joyce Woglemuth and Ted Neuman, approximately 3 miles north of Vaughn. Legal description is Sections 3, 4, 10, 11, Township 21N, Range 1E.

The project will take 12 months to complete.

## **PROJECT NO. 9**

**APPLICANT NAME:** Montana Department of Health and Environmental Sciences/Water Quality Bureau

**PROJECT/ACTIVITY NAME:** Nonpoint Source Pollution Control in Montana

**AMOUNT REQUESTED:** \$ 300,000

### **OTHER FUNDING SOURCES AND AMOUNTS:**

DHES	\$ 31,628
Conservation Districts	\$ 15,200
Soil Conservation Service	\$ 56,000
Environmental Protection Agency	\$ 1,914,766

**TOTAL PROJECT COST:** \$ 2,317,594

**RECOMMENDED FUNDING:** \$ 300,000

### **PROJECT ABSTRACT:** (Prepared and submitted by applicant.)

Montana has nearly 179,000 miles of perennial, intermittent and ephemeral streams (only two states have more), nearly three-quarters of a million acres of lakes (5 states have more), and two million acres of wetlands. Montana's waters are substantially affected by nonpoint source pollution. Nonpoint source (NPS) pollution occurs from diffuse discharges normally associated with agriculture, silviculture, mining, stream modification, construction activities, and urban runoff. NPS pollution accounts for over 90 percent of the total water pollution in Montana. Twenty-five percent of Montana's perennial streams and 75 percent of its lakes are impaired by NPS pollution. Montana has more miles of polluted streams than any other state in the nation except Oregon (1990 National Water Quality Inventory).

The enactment of Section 319 of the Federal Water Quality Act (WQA) of 1987 authorized financial assistance to states to help them implement NPS pollution control programs. Following the development of a state NPS Assessment Report and an NPS Management Plan, DHES's Water Quality Bureau became eligible for financial assistance on a 60 percent federal/40 percent state match basis. The Assessment Report and Management Plan outline strategies on how Montana can best address NPS problems.



In recent years requests for assistance to assess NPS pollution have increased in local watersheds along with requests to help implement Best Management Practices (BMPs) to reduce or eliminate NPS pollution. Montana's NPS Management Plan emphasizes the need for technical and financial assistance to help land users implement BMPs under a non-regulatory program.

The funds requested in this proposal are crucial to the success of an effective NPS program in Montana. These funds will serve as leverage for federal 319 match funds and private contributions obtained by the Water Quality Bureau. Examples of pending projects include:

- (1) Watershed projects - planning and implementation of watershed plans to address priority water quality problems.
- (2) Demonstration Projects showing new BMP technology.
- (3) Nonpoint source waterbody assessments and water quality monitoring of selected waters.
- (4) Watershed planning for total resource management.
- (5) Capacity Building for conservation districts and other local watershed project sponsors.

This list is just a representative sample of the water quality project assistance that local groups are requesting. If state match funds are not available, Montana will not be able to obtain federal funding for NPS pollution control. By combining state and federal resources, the Water Quality Bureau will be in a proactive position to help Montana residents solve their NPS water quality problems.

## **PROJECT NO. 10**

**APPLICANT NAME:** Butte-Silver Bow Local Government

**PROJECT/ACTIVITY NAME:** Upper Clark Fork Basin: Superfund-Technical Assistance

**AMOUNT REQUESTED:** \$ 93,622

### **OTHER FUNDING SOURCES AND AMOUNTS:**

Butte-Silver Bow	\$ 132,071
Local Government	

**TOTAL PROJECT COST:** \$ 225,693

**RECOMMENDED FUNDING:** \$ 93,622

**PROJECT ABSTRACT:** (Prepared and submitted by applicant.)

The principal purpose of this project is to sustain the efforts of Butte-Silver Bow, Anaconda-Deer Lodge, Powell, and Granite counties and other local governments in the upper Clark Fork river basin to coordinate and manage Superfund activities. The project allows local governments and citizens (who possess limited financial and technical resources) to hire an individual with the expertise and independent analytical capabilities to evaluate scientific reports, remedial designs, and long-term plans. Information communicated to local leaders and citizens will enable them to effectively participate in the Superfund decision making process.

The Superfund process in the upper Clark Fork river basin is continuing and will by no means be complete by 1995. In fact, major decisions related to the remediation of many of the area's most serious environmental problems, such as the Berkeley Pit water and Streamside Tailings along the entire stretch of the upper Clark Fork, will finally be under full consideration in the 1995-1997 time period. Consequently, the services and technical assistance provided through this grant would continue to be vital.

The State of Montana's support and commitment to help these four counties through this grant program is critical. The counties are struggling to attain a meaningful role in the decision making process. The upper Clark Fork river basin is a prime resource, and the eventual cleanup, reclamation, and/or mitigation of the mineral development impacts that have occurred in the area over the past 110 years is a serious challenge. There also is a Natural Resource Damage Claim negotiation between the State of Montana and ARCO, and local governments require background expertise and experience to interact effectively in the process.

## **PROJECT NO. 11**

**APPLICANT NAME:** Montana Department of Health and Environmental Sciences/Environmental Sciences Division/Solid and Hazardous Waste Bureau

**PROJECT/ACTIVITY NAME:** Superfund Geographic Information System

**AMOUNT REQUESTED:** \$ 241,548

### **OTHER FUNDING SOURCES AND AMOUNTS:**

U.S. Environmental Protection Agency \$ 40,000

**TOTAL PROJECT COST:** \$ 281,548

**RECOMMENDED FUNDING:** \$ 171,548

### **PROJECT ABSTRACT:** (Prepared and submitted by applicant.)

The four Superfund sites along the upper Clark Fork river together comprise one of the largest Superfund clean-up areas in the United States. The Clark Fork Data System Project was implemented in 1987 to organize and manage the data generated relative to the clean-up efforts. A geographic information system (GIS) component was implemented through a contract with Montana State Library (MSL) to manage the massive amount of spatial data involved and to respond to mapping and spatial analysis needs.

The goal of this ongoing project is to continue to provide mapping and spatial analysis services relative to the upper Clark Fork Superfund sites. The objective is to maintain the extensive GIS data base which has been developed along with the staff and equipment necessary to respond to user needs. It is anticipated that user needs will remain at a high level at least through FY 96/97, thereafter gradually decreasing as clean-up efforts are completed. MDHES intends to maintain access to GIS data, products, and analyses during that period through renewal of its contract with MSL.

The interagency agreement with MSL through which GIS services are provided is managed by MDHES. Overall project management is currently provided through a five-member steering committee comprising the major data providers and users in the region: MDHES, EPA, MSL, Butte-Silver Bow County Government (B-SB), and Atlantic Richfield Company (ARCO).

Although many parties are involved with remediation of the Clark Fork Superfund sites, state government will bear the long-term consequences of actions taken during remediation of the sites. MDHES, therefore, has needs that exceed those of other entities involved with the clean-up process and has a vital interest in ensuring that the critical information stored in the Clark Fork GIS is used to its full extent and preserved and maintained for future use.

## **PROJECT NO. 12**

**APPLICANT NAME:** Glacier County Conservation District

**PROJECT/ACTIVITY NAME:** Comprehensive Evaluation of Groundwater Contamination, Red River Drainage, Glacier and Toole Counties, Montana

**AMOUNT REQUESTED:** \$ 157,424

### **OTHER FUNDING SOURCES AND AMOUNTS:**

Applicant	\$ 16,407
Montana Bureau of Mines & Geology	\$ 92,546

**TOTAL PROJECT COST:** \$ 266,377

**RECOMMENDED FUNDING:** \$ 157,424

**PROJECT ABSTRACT:** (Prepared and submitted by applicant.)

Glacier and Toole counties in northwestern Montana contain thousands of oil and gas wells and as such are among the leading producers of oil and gas in the state. The area also is a major producer of dryland wheat and barley. Oilfield and farming activities have caused numerous complaints of groundwater contamination as a result of saline seep, leaking brine pits, faulty seals in production piping and casing, etc.

This project will evaluate the extent of groundwater contamination due to oilfield and agricultural activities in the 55,000 acres surrounding the Red River valley in Glacier and Toole counties.

Current groundwater quality will be compared with data from the past to determine water quality trends. The evaluation will provide baseline information for use in the evaluation of groundwater impacts due to oilfield and agricultural activities.

Water wells, oil wells, and injection wells will be inventoried and mapped and hydrogeologic investigations will be performed at selected sites. Groundwater occurrence, flow, and pollution vulnerability will be assessed with particular emphasis on aquifers used as a drinking water supply. Water samples will be collected and analyzed. A final report will include program accomplishments, conclusions, and recommendations for remediation with statewide applicability. All activities and reporting will be carefully coordinated to augment or assist existing programs by the Montana Groundwater Assessment Program, Montana Salinity Control Association (MSCA), Montana Department of Health and Environmental Sciences (DHES), Montana Department of Agriculture (MDOA), Montana Department of Natural Resources and Conservation (DNRC), and the Montana Department of State Lands (DSL). Public information dissemination will be accomplished through local conservation districts by coordination with the Statewide Resource Conservation and Development (RC&D) organization.

### **PROJECT NO. 13**

**APPLICANT NAME:** Toole County

**PROJECT/ACTIVITY NAME:** North Toole County Reclamation Project

**AMOUNT REQUESTED:** \$ 295,246

**OTHER FUNDING SOURCES AND AMOUNTS:**

Applicant	\$ 27,116
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**TOTAL PROJECT COST:** \$ 322,362

**RECOMMENDED FUNDING:** \$ 295,246

### **PROJECT ABSTRACT:** (Prepared and submitted by applicant.)

Oil development and production began in north-central Toole County in 1922. By 1954, when State regulation of the Kevin-Sunburst field became effective, several thousand wells were already in place. The development area encompassed over 13,000 acres. Environmentally safe disposal of wastes such as waste oil and brine was not yet regulated by law. Wastes such as these were commonly dumped on the land surface.

As oil production decreased, population also decreased, leaving behind many abandoned facilities. Many of these dilapidated structures and the remains of oil production equipment are still scattered over the land. Soils contaminated by past dumping of wastes remain unproductive. The condition of this oilfield is a significant threat to public health, soil productivity, water quality, and economic opportunity in the area. Removal of structural debris and reclamation of impacted soils is needed.

The purpose of the North Toole County Reclamation Project (NTRP), coordinated through the County Health Department, is to reclaim this oilfield by removal of abandoned structures and debris, to assess technologies for reclaiming oil contaminated soils, and to apply these technologies to a variety of sites. This is an on-going long-term project to accomplish the dismantling, removal of structures and associated oilfield equipment; reclamation and revegetation to productive range or croplands and the development of a planning guide to facilitate future projects throughout Montana.

#### **PROJECT NO. 14**

**APPLICANT NAME:** Montana Department of State Lands/Northeastern Land Office/Glasgow Unit

**PROJECT/ACTIVITY NAME:** Scobey Reclamation Site

**AMOUNT REQUESTED:** \$ 11,000

**OTHER FUNDING SOURCES AND AMOUNTS:**

Applicant \$ 1,018

**TOTAL PROJECT COST:** \$ 12,018

**RECOMMENDED FUNDING:** \$ 11,000

**PROJECT ABSTRACT:** (Prepared and submitted by applicant.)

An abandoned gravel wash site located on school trust lands requires cleanup of old structures, equipment, a settling pond, and debris piles. The goal of the project is to reclaim the tract and subsequently lease it. The objective of the project is to bury, burn, and remove all ruins and remains of the previous activity. The Montana Department of State Lands, Field Operations Division, Northeastern Land Office, Glasgow Unit is the responsible organization. The project is not considered statewide and is located on the SE¼NE¼SE¼ of Section 16, Township 35 North, Range 48 East, Daniels County, Montana. The project will take approximately thirty days to complete.



## **PROJECT NO. 15**

**APPLICANT NAME:** Carbon County

**PROJECT/ACTIVITY NAME:** Dry Hydrant Demonstration

**AMOUNT REQUESTED:** \$ 133,000

### **OTHER FUNDING SOURCES AND AMOUNTS:**

Headwaters/Beartooth RC&D's	\$ 9,812
Soil Conservation Service, DSL	\$ 5,440
Rural Fire Departments	\$ 20,000
City and County Governments	\$ 45,000

**TOTAL PROJECT COST:** \$ 213,252

**RECOMMENDED FUNDING:** \$ 133,000

**PROJECT ABSTRACT:** (Prepared and submitted by applicant.)

Water is the single most valuable resource a firefighter can use in fire suppression. Readily accessible sources of water are a must for rural departments in providing protection to the vast area of the state. All too often, rural firefighters lose the battle of time while obtaining water to fight a fire. Dry Hydrants, a permanent suction line installed in a pond or stream, can provide a fast, efficient source of water for these emergency efforts.

The million dollar Hawk Creek Fire in Musselshell County in 1984 followed by the 180,000 acre firestorm which swept Blaine County in 1991 provided a wake-up call for Montana residents. Volunteer fire companies diligently respond to our calls, but are often handicapped by the lack of resources to do the job. Strategic, dependable access to water is the most commonly cited need of rural fire departments.

This demonstration will introduce the concept of dry hydrants to Montana residents through a 19-county project. Beginning in fall of 1995, 61 fire departments from the southwest quarter of the state will install over 250 hydrants in critical locations. All Montana residents will be informed of the project through a statewide media campaign. Data from hydrant use in the first year will be collected and a cost/benefit analysis compiled to show the effectiveness the new system. The project is scheduled for completion by October, 1996.

This proposal seeks \$133,000 in funding to obtain the hardware necessary to develop these sites. The project will be coordinated by the Beartooth RC&D Area with the assistance of the Headwaters and Central Montana programs. The cooperative effort of rural fire departments, local government and private landowners will implement this project.

## **PROJECT NO. 16**

**APPLICANT NAME:** Petroleum County Conservation District

**PROJECT/ACTIVITY NAME:** Petroleum County Artesian Basin Groundwater Project

**AMOUNT REQUESTED:** \$ 300,000

### **OTHER FUNDING SOURCES AND AMOUNTS:**

Applicant	\$ 1,800
Montana Bureau of Mines and Geology	\$ 94,162
Board of Oil and Gas Conservation	\$ 2,210
DNRC	\$ 3,250
Landowner Match	\$ 71,554
Central Montana RC&D, Inc.	\$ 2,000
U.S. Department of Agriculture, Soil Conservation Service	\$ 7,000

**TOTAL PROJECT COST:** \$ 481,976

**RECOMMENDED FUNDING:** \$ 300,000

**PROJECT ABSTRACT:** (Prepared and submitted by applicant.)

Flowing artesian wells in Petroleum County have declined in productivity because of years of uncontrolled discharges. Many of these wells will require rehabilitation before flows can be controlled and discharges reduced. The purpose of this grant request is to provide funding to demonstrate that significant water resources can be conserved by reducing discharges from flowing wells in Petroleum County.

The Petroleum County Conservation District (PCCD) intends to show that by simply conserving water from these deep artesian aquifers, the productivity of these aquifers will be extended, providing reliable water supplies for ranching, farming, domestic use, and wildlife into the future. The project area will be within Petroleum County and will be determined by the results of a well inventory. Benefits of the project will be reduced head declines in parts of the county surrounding the demonstration area, in addition to adjacent counties. These reduced head declines will extend the life of existing water supplies by conserving groundwater that is currently being wasted. Water users in other areas dependent on flowing artesian aquifers experiencing similar problems will benefit by the results of this demonstration project and will be provided with proven methods of rehabilitating wells to conserve water resources. The project is designed to be completed in 2 years.



## **PROJECT NO. 17**

**APPLICANT NAME:** Butte-Silver Bow Local Government

**PROJECT/ACTIVITY NAME:** Travona Mine Yard: Preservation and Enhancement Project

**AMOUNT REQUESTED:** \$ 248,710

**OTHER FUNDING SOURCES AND AMOUNTS:**  
Butte-Silver Bow Local Government \$ 48,365

**TOTAL PROJECT COST:** \$ 297,075

**RECOMMENDED FUNDING:** \$ 168,740

### **PROJECT ABSTRACT:** (Prepared and submitted by applicant.)

Having played an integral role in the community's past, the historic headframe at the Travona Mine Yard in Butte (which has evolved as a mineral development impact), needs to be restored and preserved due to safety hazards, as a reminder of our history and as a focal point for the Butte-Anaconda Mining and Smelting Heritage Park. Without preservation, the headframe would fall into disrepair and would eventually have to be removed due to safety reasons. The vegetated areas surrounding the headframe have been restored to a condition of alfalfa and wild grasses. Such vegetation, however, is not compatible to an urban setting and a Heritage park concept.

As part of the overall development of the Heritage Park, the headframe of this historical mine will be evaluated, stabilized and preserved. This activity will be accomplished through an inspection and evaluation of the structure and accessory equipment, through repair and replacement of defective structures and equipment and finally through preservation by priming and repainting of the structures. The Travona's community icon status will be further enhanced by nighttime lighting of the frame, signage and seasonal displays. The mine site area will be landscaped and revegetated with shrubs and trees compatible to a urban Heritage park atmosphere and the adjacent neighborhoods.

Butte-Silver Bow will be the organization responsible for carrying out the project. The project is located in the Urban Corridor of Butte-Silver Bow. It is projected that completion of the project would require approximately 24 months.

## PROJECT NO. 18

APPLICANT NAME: Town of Walkerville

PROJECT/ACTIVITY NAME: Walkerville Parks and Recreation Project

AMOUNT REQUESTED: \$ 103,200

OTHER FUNDING SOURCES AND AMOUNTS:

Applicant	\$ 5,500
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TOTAL PROJECT COST: \$ 108,700

RECOMMENDED FUNDING: \$ 103,200

PROJECT ABSTRACT: (Prepared and submitted by applicant.)

From 1881 until 1959, the area in and around the Town of Walkerville was the site of virtually continuous mining and milling activities. The waste materials from the mining and milling processes were consolidated in dump areas which are found throughout the community.

The project calls for the development of several park/recreational areas in the Town of Walkerville. These include the further development of the recently completed Walkerville Baseball Field, construction and installation of an exercise pathway on a mine waste repository, and the completion of a basketball/tennis court on top of a cement-encapsulated mine waste dump.

All three components of this project are associated with past mining activities in the Town of Walkerville. Walkerville has been the site of much reclamation activity, consequently there are large vacant areas in Walkerville that have been reclaimed and are not presently in use. Building park/recreational areas on these reclaimed sites will not only make the property usable again, but also will protect the reclamation work now in place. The Walkerville Park and Recreation Project is important because it demonstrates the viability of redeveloping reclaimed landscapes for beneficial use.

The Town Council which represents the citizens of Walkerville will be responsible for overseeing the development and completion of these projects.

The project is expected to begin in July of 1995 and will take approximately 4 months to complete. Once RDGP funds have been obtained, the Town Council will follow all Montana law and appropriate Town Ordinances. The bids will be let according to these procedures.

**PROJECT NO. 19**

**APPLICANT NAME:** Jefferson Valley Conservation District

**PROJECT/ACTIVITY NAME:** Remote Mine Site Demonstration Project; Crystal Mine Remediation Controls Demonstration

**AMOUNT REQUESTED:** \$ 65,558

**OTHER FUNDING SOURCES AND AMOUNTS:**

Headwaters RC&D \$ 2,752  
Montana Waste Technology \$ 744,280  
Pilot Program

**TOTAL PROJECT COST:** \$ 812,590

**RECOMMENDED FUNDING:** \$ 65,558

**PROJECT ABSTRACT:** (Prepared and submitted by applicant.)

This project seeks to demonstrate new electronics systems at the Crystal Mine 7 miles north of Basin, Montana, as a method of reducing risks and total remedial costs. This would add remote process control capability to an existing data gathering, storage, and transmission system. Added remote control capability will allow the operator to monitor and control the system even while not at the site. The cost of frequent site visits, or even 24-hour presence, may no longer be required. The system could greatly reduce risks; the transmitter would send a trouble alarm and status history before a problem becomes serious. An operator could analyze the data and respond appropriately and in a timely manner. Following a few guidelines would make the equipment fairly easy to apply to a wide range of remedial applications in Montana. Although this demonstration would be at an inactive mine site, we hope to show that new technology, carefully applied and standardized, can be applied more generally at other sites of interest to DNRC throughout the state of Montana. This project will run approximately 2 years and will be subcontracted to MSE, Inc. of Butte, Montana. The deliverables will be a detailed final report and assistance on technology transfer.

This proposal adds field components and equipment that would allow remote control by command from the Butte office. This value-added effort would represent a contribution from the State of Montana to a project that has been started by a federal agency, although it is a stand-alone project with a separate budget and separate deliverables. This project extension would provide Montana with cost-effective solutions to specific state problems, along with assistance in transferring the technology to potential users needing straightforward solutions.

## PROJECT NO. 20

APPLICANT NAME: Montana Department of State Lands/Reclamation Division/  
Hard Rock Bureau

PROJECT/ACTIVITY NAME: Expansion of State Lands' Geographic Information System  
(GIS)

AMOUNT REQUESTED: \$ 124,377

OTHER FUNDING SOURCES AND AMOUNTS:  
\$ 0.00

TOTAL PROJECT COST: \$ 124,377

RECOMMENDED FUNDING: \$ 124,377

PROJECT ABSTRACT: (Prepared and submitted by applicant.)

A Geographic Information System (GIS) integrates: mapped geographic features, such as land ownership boundaries, land uses, topography and drainages, geology, and vegetation, with specific data about those features such as land uses, water quality and flow data, mineral availability, and vegetation densities. The GIS would provide the ability to query, manipulate, and analyze those data.

A GIS would be implemented by the Department of State Lands' Hard Rock Bureau. Projected goals for the implementation of the GIS would be to (1) preserve the public's health and safety, (2) conserve, protect, and prevent damage to Montana's natural resources, and (3) develop Montana's mineral resources.

There are five basic objectives for the GIS system. First, the GIS would help the Bureau produce more comprehensive water monitoring plans and inspections, and would help determine and document compliance or lack of compliance with Montana's air, water, and reclamation laws. Second, this system would allow the Bureau and associated agencies to effectively review major mine proposals within statutory time frames without redundancy and duplication. Potential fatal flaws or deficiencies in proposals would be more clearly identified. Third, this system would assist the Bureau in more accurately predicting and disclosing environmental impacts. Fourth, all exploration projects, small mines, abandoned mines, and hard rock and coal mining operating permits could be located and their development tracked. Fifth, the accuracy in calculation of reclamation bonds would be facilitated.

The system would be set up at the Department of State Lands' office at 1625 11th Avenue, Helena, Montana. Its application is statewide. Only initial funding is needed. Costs for personnel, hardware, hardware maintenance, software, software updates, travel, and communications are \$124,377. Annual reports would be submitted to document work facilitated by use of the system.

## **PROJECT NO. 21**

**APPLICANT NAME:** Eastern Sanders County Conservation District

**PROJECT/ACTIVITY NAME:** Plains Area Recreation Center-PARC

**AMOUNT REQUESTED:** \$ 153,600

### **OTHER FUNDING SOURCES AND AMOUNTS:**

Applicant	\$ 1,000
Plains Baseball Association	\$ 1,500
Army Reserves	\$ 15,000

**TOTAL PROJECT COST:** \$ 171,100

**RECOMMENDED FUNDING:** \$ 153,600

**PROJECT ABSTRACT:** (Prepared and submitted by applicant.)

The Plains, Montana area has a lack of baseball/softball playing fields. Fields available are on school property. The school is currently contemplating expansion of buildings onto the fields. This action would result in discontinued use of the area for baseball. The current field situation is inadequate. Twelve local teams try to practice and play on these two fields each week. This problem will be compounded when the use of school property is discontinued.

The project seeks to provide a safe, healthy, central recreational facility for area youth and families by reclaiming the property with shrubs and grasses preventing further erosion and pollution of the Clark Fork river. Our community depends largely upon the lagging timber industry. The unemployment rate in the county is 16 percent, second highest in Montana. Financial assistance is needed due to the depressed economy in Sanders County. The project would create an economic boost to Plains by providing facilities to host numerous tournaments, thereby bringing people to town. This would increase restaurant, hotel, gas and grocery revenues.

Eastern Sanders Conservation District in conjunction with the Plains Baseball Association would oversee the administration of funding.

The project site is the old Diehl lumber mill and sawdust piles along the Clark Fork bordering the city limits east of Plains in Township 19 North, Range 26 West, the Northwest Quarter of Section 35.

The project would take approximately 12 months after funding is available, weather permitting.

**THE FOLLOWING PROJECTS ARE NOT RECOMMENDED FOR FUNDING. THE LIST IS ALPHABETIZED BY THE NAME OF THE PROJECT SPONSOR.**

<u>APPLICANT NAME:</u>	Libby Area Conservancy District (LACD)
<u>PROJECT/ACTIVITY NAME:</u>	Libby, Granite, Cherry Creek Long Range Flood Plan
<u>AMOUNT REQUESTED:</u>	\$ 35,000
<u>OTHER FUNDING SOURCES AND AMOUNTS:</u>	
(LACD mill levy)	\$ 1,600
(in-kind volunteer labor to be done in the summer of 1995)	\$ 4,500
<u>TOTAL PROJECT COST:</u>	\$ 41,100
<u>RECOMMENDED FUNDING:</u>	\$ 0

PROJECT ABSTRACT: (Prepared and submitted by applicant.)

The Libby Area Conservancy District (LACD) proposes to provide for some type of permanent solution to the worsening flooding of Libby, Granite and Cherry Creeks, (hereinafter referred to as the Creeks) that are located adjacent to and south of Libby, Montana. LACD action would:

(a) improve water quality in the Creeks by lessening the movement of streambed load and provide for stream bank stabilization, (b) diminish the risk of the loss of life and property in the flood plains of these Creeks, (c) provide for one central government body to facilitate the cooperation of all agencies and private land owners that manage or control the Creeks and (d) obtain cooperative funding, if available, to carry out the works needed to accomplish these objectives.



In order to accomplish the goals of the LACD, the reasons for the worsening flood conditions must be determined. These Creeks have always flooded as natural events and will continue to do so. Hydraulic mining in the headwaters of these drainages in the late 1800s started the "unravelling" of these stream courses. Many land use changes since that time in both the watersheds and the flood plains have exacerbated the condition.

Before any changes can be implemented it is necessary to know the root causes of these problems. Our project proposes to investigate these and then develop a Master Long Range Plan. Then a priority list will be developed for implementing cost-effective, long lasting action. LACD will have a consulting firm carry out this investigation and plan development. The consultant's work will be initiated in July of 1995 and be completed by June of 1996.

**APPLICANT NAME:** Mile High Conservation District

**PROJECT/ACTIVITY NAME:** Accelerated Soil Survey of Silver Bow County, Montana

**AMOUNT REQUESTED:** \$ 282,240

**OTHER FUNDING SOURCES AND AMOUNTS:**

Soil Conservation Service	\$ 381,125
Headwaters RC&D Area, Inc.	\$ 2,970
Applicant	\$ 400

**TOTAL PROJECT COST:** \$ 666,735

**RECOMMENDED FUNDING:** \$ 0

**PROJECT ABSTRACT:** (Prepared and submitted by applicant.)

The purpose of this grant request is to accelerate the Silver Bow County progressive soil survey for which is scheduled to begin in 1995. The Soil Conservation Service has completed approximately 16 percent of the soil mapping for Silver Bow County. The cropland was soil mapped prior to 1990 to meet the requirements of the 1985 Food Security Act. From 1987 until 1990, statewide priorities for soil survey were directed toward the croplands, mostly in central and eastern Montana, and away from the fragile forestlands and rangelands of western Montana. After the deadline for the 1985 Food Security Act was met, SCS's federal funding for soil survey in Montana was dramatically decreased, inhibiting any shift in soil survey priorities to western Montana.

Soils information is necessary for soil and water conservation planning, water quality planning, and preventing costly erosion land management and development decisions. Because Silver Bow County offers unique soil conditions due to past mining activities, it is especially important to have good soil information that can serve as a base for reclamation planning and wise land-use decisions.

The proposed project provides staff for the Silver Bow County Soil Survey: five full-time soil scientists and a part-time cartographic technician for two years. It also will provide training, field equipment, office space, travel expenses, and general administrative support to complete the project.

The project will result in completion of the Silver Bow County Soil Survey, with 267,000 acres being soil mapped over a 3-year period ending in 1997.

APPLICANT NAME: Montana Tech of the University of Montana/Department of Chemistry

PROJECT/ACTIVITY NAME: Iron Oxidation and Transport at the Bullion Mine

AMOUNT REQUESTED: \$ 64,397

OTHER FUNDING SOURCES AND AMOUNTS:

Center for Advanced Mineral Processing	\$ 15,000
Sabbatical leave	\$ 13,018

TOTAL PROJECT COST: \$ 92,415

RECOMMENDED FUNDING: \$ 0

PROJECT ABSTRACT: (Prepared and submitted by applicant.)

This proposal outlines the initial phases of a doctoral project to be conducted by the principal investigator. This investigator is currently a faculty member at Montana Tech, and if this proposal is funded, these funds would be combined with those provided by Montana Tech for a sabbatical leave to start the fall of 1995. The funds requested, plus those of the sabbatical leave, would then provide 100 percent salary support for three summers, one academic year, and a portion of two additional academic years. It is estimated that completion of the research and dissertation phases will take about 3 years.



The proposed project will investigate the kinetics of the oxidation of ferrous to ferric iron and the subsequent transport of the ferric iron in the drainage stream at the Bullion Mine. The claim is located in southwestern Montana in Powell County, on the Deerlodge National Forest, approximately 5 miles north-northwest of the town of Basin, Montana (SW  $\frac{1}{4}$  of SW  $\frac{1}{4}$  section 31, T8N, R5W).

Preliminary data suggest that the rate of oxidation of Fe(II) to Fe(III) is occurring at a rate  $5 \times 10^6$  times faster than predicted by the rate law. An investigation of the factors affecting this rate is outlined in this proposal. Computer modeling of the data is proposed to help define the factors involved in the iron oxidation chemistry.

Once the iron is in the ferric form, it is not precipitating as predicted based on the solubility of ferric hydroxide, but instead is being carried by the flow at a concentration 10 times greater than expected. This proposal also outlines what steps will be taken to elucidate the mode of this transport. Very small colloidal particles have been reported in the literature for acidic, iron(III) containing solutions. These particles have been identified as having the ability to strongly adsorb arsenate from solution. If this is the case, the ferric iron may be facilitating the transport of arsenic in these waters.

The State of Montana has many abandoned mines such as the Bullion. It is of critical importance that we increase our understanding of the chemistry involved in these drainage waters. This base of understanding will allow us to better approach permanent solutions to these problems. A number of solutions have been attempted. These are often only short range "band-aids" because the nature of the problem is not thoroughly understood.

Funding in the sum of \$15,000 has already been awarded to Montana Tech for this project by the Center for Advanced Mineral Processing at Montana Tech. These funds will be used to supplement the work proposed here.

APPLICANT NAME: Town of Walkerville

PROJECT/ACTIVITY NAME: Reclamation of the Marget Ann Claim Block

AMOUNT REQUESTED: \$ 300,000

OTHER FUNDING SOURCES AND AMOUNTS:

Applicant	\$ 1,500
New Butte Mining, Inc.	\$ 22,028
Pesanti Ranch Co.	\$ 2,000
Butte-Silver Bow	\$ 1,350

TOTAL PROJECT COST: \$ 326,878

RECOMMENDED FUNDING: \$ 0

PROJECT ABSTRACT: (Prepared and submitted by applicant.)

A century of mining and exploration in the Butte area has left the landscape visibly scarred. Mining law requiring discovery monuments and annual assessment work has left hundreds of glory holes and rock piles littering the landscape. Located at the top of the Butte Hill, and within the City Limits of Walkerville, the Marget Ann claim block is no exception.

The Marget Ann claim block contains 520 acres of which 318 acres are being addressed in this application, with approximately 10 percent of the area covered with abandoned mine dumps and exploration pits. Mining ceased in 1958 with no efforts to fill abandoned shafts or reclaim mine dumps. Modern exploration and research techniques have determined that economically recoverable mineralization probably no longer exists. Besides being ugly the area in its present condition is a risk to human use because of numerous exploration pits and trenches, a source of air and water pollution from wind and rain erosion of exposed dumps.

The goal of reclaiming the area is to restore the land to productive use, eliminate hazards to the human environment, and create the potential for economic development not related to mining. To obtain these objectives, abandoned mine shafts will be uncovered and filled, waste dumps removed to a licensed disposal area, exploration trenches and holes filled, and disturbed lands revegetated. New Butte Mining, Inc. in cooperation with the Town of Walkerville and local landowners, is responsible for managing and executing the proposed reclamation plan if funding is approved.

## CHAPTER III

### **STATUS REPORT OF 1987-1993 PROJECTS**

This chapter briefly summarizes the status of active projects and those projects that have been completed since preparation of the January 1993 Legislative Report. The projects are grouped according to the year in which they received legislative approval; within each such grouping, the projects are presented in the order of their relative funding priority since 1987. At the end of the chapter is Table II, which shows funding information for all authorized projects.

#### **Projects Approved by the 1993 Legislature**

1. Montana Board of Oil and Gas Conservation/Kevin-Sunburst Plugging and Reclamation Project

The Board of Oil and Gas Conservation (BOGC) proposed to plug the well bore and reclaim the surface at 26 abandoned oil and gas test well sites in Toole and Liberty Counties. The wells pose a threat to groundwater and surface water quality, oil and gas production zones, and surface vegetation. This project is part of BOGC's ongoing program to identify and plug abandoned, problem well sites. Bids for the project will be let in December, 1994. Plugging is expected to be complete by August, 1995. RDGP grant funds in the amount of \$299,000 are appropriated for this project.

2. Montana Board of Oil and Gas Conservation/Cat Creek Plugging and Reclamation Project

The purpose of this project is to plug the well bore and reclaim the surface at three abandoned oil and gas well sites in Petroleum County. The status is as follows:

- i. Arro Oil and Refining Co., Charles #1, Section 21, Township 15 North, Range 30 East. The work is in progress. "C" Brewer, Inc. began plugging the well in early November, 1994. The location will be reclaimed to the original surface contour and seeded. The final approval is expected in June of 1995 after re-vegetation.
- ii. Bragg and Johnson, Jackson 1-A, Section 27, Township 15 North, Range 30 East. The work is in progress. "C" Brewer, Inc. will finish plugging the well in November, 1994. The location will be reclaimed to the original surface contour. The final approval is expected in November, 1994. The well is in a cultivated field.

- iii. Pacific Petroleum Ltd., Charles #4, Section 21, Township 15 North, Range 30 East. "C" Brewer, Inc. completed plugging the well in October, 1994. The location will be reclaimed to the original surface contour and seeded. The final approval is expected in June of 1995 after re-vegetation.
3. Governor/Lieutenant Governor's Offices/The Montana Office of Public Policy Dispute Resolution

The Office of Public Policy Dispute Resolution provides consultation, training, and mediation services designed to resolve complex, multi-party natural resource issues. The status is as follows:

Governor Marc Racicot appointed the Director in September, 1993. The Consensus Council was officially created by executive order in January, 1994. A Board of Directors was appointed at the same time.

During its first year, the Council helped resolve the dispute over recreational access to state school trust lands, and a long-standing dispute over the impact of a mining permit on private lands. The Council has also facilitated processes to develop a comprehensive land use plan in Ravalli County; an ecosystem management plan in the Bitterroot Valley; and an agreement on suggested amendments to the federal Endangered Species Act. The Council is currently facilitating processes to build agreement on the protection of instream flows; to design a collaborative planning process to foster sustainability in Beaverhead County; and to foster sustainable communities in North Central Montana.

The Council is working with the Montana Supreme Court to design a dispute resolution program for the appellate judicial system; helped the Yellowstone River Compact Commission design a dispute resolution system for administering the compact; and is participating in the design of a conflict management center at the University of Montana. It helped create and participates in the Montana Consensus Roundtable, a group of practicing facilitators. The Council also participates in the Transboundary Initiative, a regional consortium on conflict management and public policy.

The Council has organized and taught three training seminars for state, federal, and international natural resource managers; made presentations to several public, private, and non-governmental organizations; and has produced seven publications for public information and education.

The Council has had the opportunity to work with a variety of citizens, communities, and public, private, and non-governmental organizations.

4. Town of Walkerville/Walkerville Reclamation Project

The Town of Walkerville constructed a new softball field to replace one eliminated by mining. There were no plans by EPA to replace the recreational opportunity lost. The project is complete with the exception of minor cleanup to be conducted in Spring, 1995.

5. Broadwater Conservation District/Whites Gulch Placer Mine Reclamation Project

Broadwater Conservation District proposed to reclaim approximately two miles of stream channel in Whites Gulch, north of Townsend. The stream contains a genetically pure strain of westslope cutthroat trout threatened by impacts caused by past placer mining activities. Implementation of the stream stabilization measures proposed would protect and possibly enhance populations of this sensitive species, decrease sedimentation, and improve water quality. Public bid opening was on October 18, 1994. All bids received exceeded available funds. The project will be readvertised for bid during Spring, 1995.

6. Toole County/North Toole County Oil Field Reclamation Project

Toole County proposed to reclaim areas in northern Toole County adversely impacted by past oil and gas development activity. The work involves inventory and site selection, removal and burial of structures and debris, drilling of monitoring wells, treatment of contaminated soils, disposal of oil sludge material, and revegetation. The project is approximately 60 percent complete. The work is now on hold while Toole County awaits the outcome of its 1994 RDGP grant application. If the 1994 grant is approved, both grants will be combined to bid one project.

7. Montana Department of Fish, Wildlife and Parks (DFWP)/Elk Creek Placer-Mined Channel Reconstruction

The Department of Fish, Wildlife and Parks (DFWP) will reconstruct approximately 3,000 feet of the Elk Creek stream channel. The site is located on BLM land about one mile east of Garnet. Past placer mining activity has destroyed the original channel and eliminated any surface flow along three reaches. The fishery resource and spawning habitat have been directly impacted. Reestablishment of the stream channel and riparian area would restore the fishery, improve water quality, and increase recreation potential. The project would serve as a demonstration site on how to implement best management practices on streams damaged by placer mine operations.

A prebid conference was held for the Elk Creek Project on April 5, 1994. The conference included a field review and a meeting at the Lubrecht Conference Room to explain the plans and the bidding process. The conference was attended by five contractors.

Two bids were received and the contract was awarded to Rich/Mark Corp., Lincoln, Montana with a notice to proceed issued August 8, 1994. Work actually began on October 15th and will be complete during November, 1994.

8. Town of Columbus and Town of Joliet/Waste Stream Reduction--Oil Recycling

This project would establish a pilot waste-oil collection center in 6 Montana communities. The grant contract is currently being negotiated with the project sponsor.

9. Carbon County Conservation District/RC&Ds Affecting Change Through Local Leadership

This project funds the seven RC&Ds around the state to complete regional rural economic development plans. The Montana State Association of RC&Ds will be using these funds to complete a statewide economic development plan based on the regional plans. This project also includes conducting workshops and initiating 35 specific projects. Initial work has begun to develop regional plans. Each RC&D has organized planning committees which are now beginning the development of strategic issues.

10. Montana Department of Health and Environmental Sciences/Water Quality Bureau/Nonpoint Source Pollution Control in Montana

This project will continue Montana's voluntary Nonpoint Source Pollution Program. Funds will be used for watershed project implementation, water body assessment, educational materials, and technical assistance. This project has not yet been contracted, no funds have been disbursed.

11. Montana Bureau of Mines and Geology/Acid Mine Drainage Prevention, Control, and Treatment Technology Development for the Stockett/Sand Coulee Area

The Montana Bureau of Mines and Geology proposes to investigate appropriate technologies for the prevention, control, and remediation of acid mine drainage in the Stockett/Sand Coulee area. The investigation would include a thorough hydrological inventory, sampling, and assessment; evaluation and design of possible prevention techniques; implementation of promising techniques at selected mine sites; and monitoring of the success or



failure of the implemented techniques.

The first step in controlling the highly acidic water discharging from abandoned coal mines in the Stockett/Sand Coulee area is to develop a thorough understanding of the hydrogeologic setting and reactions that are controlling the acid formation. Field trips to the study site have provided the first data for this project. The first water-quality samples have been collected. An acid-resistant flume has been installed at the portal which is discharging at a rate of 20 gallons per minute of pH 2.5 water. Continuous recorders have been installed at 5 sites and databases are being built on office computers.

12. Deer Lodge Valley Conservation District/Developing Acid/Heavy Metal-Tolerant Cultivars for Mine Reclamation

The Deer Lodge Valley Conservation District proposed to conduct two initial stages of a long-term effort to make acid/heavy metal-tolerant native plant species available to commercial seed growers. The two-year CD project would involve collection of native plant species with subsequent establishment of test plots and evaluation at two sites (near Anaconda and East Helena). Execution of the grant agreement will be completed in November, 1994.

13. Glacier County Conservation District/Comprehensive Evaluation of Groundwater Contamination, Red River Drainage

The CD proposed to evaluate the extent of groundwater contamination resulting from oil and gas and agricultural activities. The study would be conducted by the Montana Bureau of Mines and Geology. RDGP funding was not available for this project.

14. Valley County/Fort Peck Reservoir Breakwater

Valley County proposed to construct an 800-foot earthen embankment (breakwater) across Perch Bay, which is located approximately one mile west of Fort Peck Dam. The breakwater was to protect water craft and shore facilities from damaging wave action during inclement weather. RDGP funding was not available for this project.



15. Montana Department of Natural Resources and Conservation/Water Management Bureau/Arsenic Transport and Mobility in Surface Water, Irrigated Soils, and Shallow Groundwater of the Upper Missouri River Basin

The Water Management Bureau of DNRC proposed to study the mobility and transport of arsenic in soils, surface water, and groundwater; develop predictive computer models of mobility and transport; and evaluate effects of resource management on arsenic levels. The project results could have been used by a variety of resource managers in planning future water and land uses and allocations and would provide health agencies an improved basis for evaluating existing public exposure to arsenic in surface water and groundwater. RDGP funding was not available for this project.

16. Ravalli County/A Lake For Better Water Quality (Como Lake Dam Rehabilitation)

Ravalli County proposed to raise the height of Como Dam an additional 9.3 feet. The additional water storage would serve four primary objectives: (1) improve water quality and the Bitterroot River fishery, (2) dilute high nutrient concentrations in the lower Bitterroot and Clark Fork rivers, (3) provide additional irrigation water during drought to over 785 irrigators on 16,635 acres of land, and (4) add over 220 surface water acres to Como Lake. RDGP funding was not available for this project.

17. Butte-Silver Bow/Mitigation of Mining and Smelting Damage through Urban Forestry

Butte-Silver Bow proposed to purchase and plant 360 trees and shrubs near high traffic areas. This project was designed to mitigate adverse impacts caused by past mining and smelting activities and to visually enhance the gateways, parkways, and streets leading to uptown Butte. RDGP funding was not available for this project.

18. Town of Hot Springs/Camas Therapy Center

The Town of Hot Springs in cooperation with CAM Redevelopment Corporation proposed to renovate the old Camas bathhouse and develop a modern hot mineral water therapy center. This project would have eliminated existing health and safety hazards, created substantial job opportunities in a severely distressed local economy, and provided a local health care and therapy facility. RDGP funding was not available for this project.

### Projects Approved by the 1991 Legislature

1. Butte-Silver Bow; WASTEC (Water, Air, Soils Testing and Evaluation Center)

This project was formally renamed the National Environmental Waste Technology Testing and Evaluation Center (NEWTTEC) in December, 1992. NEWTTEC is operated from the Department of Energy's (DOE's) Component Development and Integration Facility (CDIF) in Butte, Montana. It provides a mechanism to research, develop, demonstrate, and commercialize new and existing waste and energy technologies. The NEWTTEC programs include Thermal Treatment, Water and Solid Treatment, and Waste Minimization and represent approximately \$20 million annually for the testing, evaluation, and demonstration of technology for numerous clients.

The CDIF has obtained long-term funding commitment from DOE enabling retrofit of the facility to a waste technology testing facility. The retrofit includes receiving and preparation areas; high-test bay areas for multiple testing; observation area; bench scale test area; analysis area; emission control and containment area. The RDGP grant was completed in July, 1994.

2. Chinook Irrigation District; Milk River Water Supply Project Rehabilitation and Betterment Element (Canals and Laterals)

This project involves the rehabilitation of the Chinook Irrigation District's portion of the 80-year-old Milk River Irrigation Project. Existing structures will be repaired or replaced, and new structures will be added to reduce chronic water shortages. The 1991 Legislature appropriated \$300,000 for this project. As of October, 1994, no funds have been disbursed to the project sponsor.

3. Judith Basin Conservation District; Community-Led Rural Development in Montana

Judith Basin Conservation District is sponsoring the implementation of a statewide, community-led rural development effort through the organization and development of three new Resource Conservation and Development (RC&D) areas. RC&Ds work on matters of natural resource management, economic development, community development, and human development. The three RC&D areas involved are Northwest Regional, North Central Montana, and Eastern Plains. Eastern Plains has completed its portion of this project and the other two areas are nearing completion.

4. Montana Department of Health and Environmental Sciences and the Central Montana Health District; Arro Refinery Sludge Cleanup

This project involved the cleanup of two sludge pits at the abandoned Arro Oil Refinery near Lewistown. The pits posed a hazard to area residents, wildlife, an adjacent stream, and groundwater. This project has been completed.

5. Montana Board of Oil and Gas Conservation; Abandoned Well Plugging Project "A"

This project involves the reclamation of four well sites. The work includes preparing the surface, rigging up an appropriately sized drilling or workover rig, re-entering and filling or cleaning out the wells, and setting cement plugs in the holes or cast iron bridge plugs in the holes or cast iron bridge plugs in cased portions of the wells. The surface area is then cleaned of debris and drilling materials, the pits are backfilled and leveled, and the area is recontoured and revegetated.

Current status is as follows:

- i. Tri City Oil #1 Van Dusen, Section 29, Township 8 North, Range 21 East. The surface owner filed a water right on this well. The well will be removed from the grant.
- ii. Van Dusen Oil Co., Van Dusen #2, Section 26, Township 8 North, Range 21 East. All work has been performed and the location was inspected and released in the spring of 1993.
- iii. Montana Yellowstone, Haskell #1, Section 4, Township 14 North, Range 55 East. All work has been performed and the location was inspected and released in the spring of 1993.
- iv. Musselshell Oil, Mitchell #5, Section 21, Township 15 North, Range 30 East. Work is in progress. Currently, "C" Brewer, Inc. is reentering the old well bore. The well should be plugged by mid-November barring delays. The location will be seeded. The final approval is expected in June of 1995 after re-vegetation.

6. Montana Board of Oil and Gas Conservation; Abandoned Well Plugging Project "B"

This project involves the reclamation of three well sites. The procedures are the same as those described for Plugging Project "A".

Current status is as follows:

- i. American Indian Well #2, Section 6, Township 2 South, Range 24 East. All work has been performed and the location was inspected and released in the spring of 1994.
- ii. Tri City Oil Co., Well #3, Section 21, Township 8 North, Range 21 East. All work has been performed and the location was inspected and released in the spring of 1994.
- iii. Musselshell Oil Co., Unknown, was determined to be: Williams Syndicate, Fifer 1-A, Section 20, Township 15 North, Range 30 East. The work is in progress. Elenburg Exploration, Inc. completed plugging the well on October 14, 1994. The location will be reclaimed to the original surface contour and seeded. The final approval is expected in June of 1995 after re-vegetation.

7. Montana Salinity Control Association (MSCA); Soil and Water Nonpoint Source Pollution Control and Management

MSCA operates a program of technical field assistance designed to correct saline seep and reclaim land on a farm-by-farm basis. Recharge area identification, hydrogeologic investigation, and soil and water quality sampling and monitoring are used to develop reclamation plans that emphasize intensive cropping methods. MSCA is in the process of initiating fieldwork and planning for 20 new projects.

8. Montana State University/Reclamation Research Unit; Effect of Sodium, Chlorine, and Total Salts from Treated Cyanide Solutions on Soils

MSU is evaluating the impact of discharging treated or excess dilute cyanide solutions on land application areas in terms of sodium, chlorine, and salinity. Field sample collection is 75 percent complete. The project is scheduled to be completed by the end of August 1995.

9. Carbon County, Stillwater County, and the City of Big Timber; Integrated Waste Management in Southcentral Montana

This project was completed in June, 1994. The objective of the project was to develop a model integrated waste management program for Carbon and Stillwater counties and the City of Big Timber.

Public information and educational efforts proved to be very rewarding. Four brochures covering different solid waste topics were developed and mailed to all residents in the project's area. Two editions of the Tri-Cyclers Times Newsletter were published. Several additional flyers and brochures were produced whose target audiences were smaller geographical areas within the project area. A library of solid waste related materials was developed including videos, books, periodicals, curriculums, newsletters, etc. These materials provided needed research information to the coordinator and other interested parties, as well as to teachers preparing for activities such as Earth Day. The coordinator assisted Beartooth RC&D and MSU Extension (Bozeman) in the planning and implementation of the solid waste continuing education course for teachers entitled "Away-With-Waste". The coordinator spoke with several groups of students, teachers, and service clubs on the topic of recycling.

The Soil Conservation Service, in conjunction with the coordinator, created a traveling display which was placed in the rotunda of the capitol building in Helena during the special session in late 1993, as well as in several courthouses and meeting rooms throughout the year.

Much time was spent developing the equipment phase of the grant. Recycling bins on wheels proved to be the best method of getting recycled materials to the markets after other options were researched and discarded. Developing the best design has been ongoing, the grant was amended to accommodate the cost of the traveling recycling trailers; three trailers have been completed and are in use.

A small pilot bioconversion (anaerobic composting) project was implemented. Technical assistance was provided to community groups and towns organizing recycling drives. The coordinator was the liaison between Billings Recycling, Inc., the nearest recycling marketer, and the different recycling groups. Meetings were arranged between Tri-Cycler members from various communities where ideas, successes, and failures were shared.

10. Montana Department of Health and Environmental Sciences/Water Quality Bureau; Nonpoint Pollution Control Project in Montana

This project will provide continued funding for a voluntary statewide management program to control nonpoint source pollution. Some of the accomplishments on this project so far are providing technical assistance for watershed planning on Nevada Creek in Powell County, sponsoring a fluvial geomorphology course for those who will be installing best management practices, ongoing stream assessments and monitoring, and education activities in the Blackfoot River valley as part of the Blackfoot Challenge program. Other activities to come under this project are implementation of demonstration projects which involve installation of best management practices to control nonpoint source pollution from agriculture, forestry, mining, and channel modification on selected watersheds. The public education component will disseminate information on nonpoint source pollution and methods for control.

11. Montana Bureau of Mines and Geology (MBMG); Downhole Geophysical Logging Techniques Applied to Cased Water Well or Monitor Well Completion

The purpose of this project is to develop and document geophysical methods for investigating well completions in water wells and monitor wells. In July, 1994, 236 geophysical tests were performed in a laboratory-type setting. The tests included bentonite, sand and neat cement seals around three weights of PVC and steel casing. Geophysical tools used were: gamma-gamma (4 pi and focused with 2 source sizes and 2 spacings); neutron; and natural gamma. Field tests were performed in the Bull Mountains, Colstrip, and Decker areas in existing wells. The next effort will be to edit and organize the data files and to interpret the results. A preliminary review of the data indicates that signatures may exist for specific well completions in specific lithologies. More interpretation will be needed to explain the useability of the methods.

12. Montana Board of Oil and Gas Conservation; Abandoned Well Plugging Project "C"

This project involves the reclamation of six well sites. The procedures are the same as those described for Plugging Project "A".

Current status is as follows:

- i. Century Oil and Gas Co., Mason 20-7, Section 20, Township 29 North, Range 50 East. All work has been performed and the location was inspected and released in the fall of 1994.
- ii. Century Oil and Gas Co., Mason 20-9, Section 20, Township 29 North, Range 50 East. All work has been performed and the location was inspected and released in the fall of 1994.



- iii. Ray Harrison, Graves #1, Section 24, Township 11 North, Range 24 East. "C" Brewer, Inc. completed plugging the well in October, 1994. The location has been inspected and approved. Re-vegetation was not required.
- iv. Ray Harrison, Tina McCall #2, Section 24, Township 11 North, Range 30 East. The work is in progress. "C" Brewer, Inc. plugged the well in October, 1994. The location has been reclaimed to the original surface contour and seeded. The final approval is expected in June of 1995 after re-vegetation.
- v. Century Oil and Gas Co., NP #1, Section 21, Township 9 North, Range 23 East. The work is in progress. "C" Brewer, Inc. plugged the well in October, 1994. The location has been reclaimed to the original surface contour and seeded. The final approval is expected in June of 1995 after re-vegetation.
- vi. B. F. Hoyt, Well #1, Section 7, Township 2 South, Range 24 East. The well was bonded by the surface owner as a domestic gas well. This well will be removed from the grant.

13. Toole County; North Toole County Reclamation Project

The objectives of this ongoing project are to continue inventory and assessment of sites needing reclamation, characterize groundwater quality in the area, accomplish removal and burial of abandoned buildings and equipment, continue soil reclamation research, and implement research results. Bids for site cleanup were let in September, 1992. The project was successfully completed in June, 1994.

14. Carbon, Chouteau, Custer, Dawson, and Lake Counties; Pesticide Contamination Cleanup

The purpose of this project is to complete the cleanup portion of the pesticide project begun by DHES and described in this report under Projects Approved by the 1989 Legislature. The Legislature appropriated \$300,000 for this project. This project is not yet under contract, no funds have been disbursed.



15. Butte-Silver Bow; Upper Clark Fork River Basin Coordinator

Butte-Silver Bow has hired a Superfund issues and technical information coordinator to provide policy, procedural, and technical information to the local governments and citizens of Silver Bow, Deer Lodge, and Granite Counties to enable them to effectively participate in decisions concerning the assessment, management, and rehabilitation of the basin's natural resources impacted by past mining. The project is functioning extremely well according to the local governments. A summary of reported activities is too lengthy to include in this report but is available from DNRC. The project will be completed in June, 1995.

16. Montana Department of Natural Resources and Conservation (DNRC); Arsenic in the Upper Missouri River Basin

DNRC, in conjunction with the U.S. Geological Survey and Montana State University, is evaluating surface water and groundwater arsenic concentrations and loads in the upper Missouri River system. Data currently being gathered will be used to evaluate the effect of water management actions in the basin and help identify appropriate measures to minimize arsenic's impact on basin water quality.

17. Montana Department of State Lands; Well Assessment and Abandonment

The construction phase of this well plugging grant was completed in November of 1993. The grant was to have evaluated and/or plugged 26 wells. During the construction work an additional six wells were located on the section. A total of 32 wells were plugged and abandoned on the State section. In mid-August of 1994 a review of the unbonded wells in the same general vicinity was completed. There were no significant findings from this review.

18. Montana Department of State Lands (DSL); Comet Mine Wetlands Development

DSL proposed to construct a wetlands water treatment system downstream of the Comet Mine tailings to remove heavy metals biologically and chemically from the tailings drainage water. Current heavy metal concentrations are severely impacting the water quality of High Ore Creek and the Boulder River. Successful implementation of this project would prove useful at similar remote, high altitude mine sites. The legislature appropriated \$250,700 for this project. The project will not be contracted due to a shortage of RDGP funds.

19. Glacier County Conservation District; Comprehensive Evaluation of Groundwater Contamination

Glacier County Conservation District proposed to examine the extent of groundwater contamination due to oil field and agricultural activities in the Red River Valley drainage of Toole and Glacier Counties. This study would be conducted by the Montana Bureau of Mines and Geology. The legislature appropriated \$197,453 for this project. The project will not be contracted due to a shortage of RDGP funds.

20. Montana Department of Health and Environmental Sciences (DHES)/Water Quality Bureau; Hydrogeology, Land Use, and Chemical Quality of Water Resources in the Clarks Fork Yellowstone River Basin

This study is designed to develop an understanding of the hydrogeologic flow systems in the Clarks Fork Yellowstone River basin, identify the extent of existing or potential groundwater contamination problems, identify vulnerable groundwater sources, and provide information necessary for resource managers and the public to make sound decisions regarding protection of water resources. Results of the study would be utilized by the public and agencies to design and implement optimum groundwater pollution prevention programs. The legislature appropriated \$218,250 for this project. The project will not be contracted due to a shortage of RDGP funds.

21. Sheridan County Conservation District; Extent of Oil Field Waste Contamination

The primary objective of this project was to define the extent of contamination in the Goose Lake area of eastern Sheridan County. The extent of the contamination would be defined by measuring water levels and water quality in vertically separated sand and gravel zones within the outwash deposit. These data would be interpreted to document the degree of hydraulic interconnections between the various sand and gravel zones. Once the extent of contamination is established, recommendations for mitigating the problem would be developed. The legislature appropriated \$134,736 for this project. The project will not be contracted due to a shortage of RDGP funds.

22. Yellowstone County; Yellowstone County LIS/GIS Project

Yellowstone County proposed to develop a county-wide Land Information System/Geographic Information System (LIS/GIS). A LIS/GIS is an automated database used to store, update, manipulate, and display all types of spatial information. Examples of types of information that can be part of a GIS are floodplain maps, irrigation districts, land zoning boundaries, sewer systems, and comprehensive plans. Statistics show that approximately 90 percent of the decisions by the Yellowstone County government involve geographic information. The legislature appropriated \$50,000 for this project. The project will not be contracted due to a shortage of RDGP funds.

23. Montana State University (MSU)/Biology Department; Trout Stream Restoration

The MSU Biology Department proposed to further evaluate results of a previous fish habitat improvement project funded by a 1985 RIT grant. Located near Townsend, this 1985 project was completed in 1988 and involved installation of 40 log sills, to help restore trout habitat from placer mining damage in Confederate Gulch, and installation of riprap and tree revetments, to help stabilize severely eroding streambanks in Deep Creek. The objective of this 1991 proposal was to obtain funds to complete the postconstruction evaluation for three additional years using established monitoring procedures and equipment. The legislature appropriated \$45,500 for this project. The project will not be contracted due to a shortage of RDGP funds.

24. Montana Salinity Control Association (MSCA); Supplemental Funding for Soil and Water Nonpoint Source Pollution Control and Management

The project is the same as project 7 above. An additional \$62,500 was appropriated. The project will not be contracted due to a shortage of RDGP funds.

### Projects Approved by the 1989 Legislature

1. Montana State University (MSU)/Reclamation Research Unit; Fate of Cyanide in Soils and Heap-Leach Pads

A study was conducted at the Kendall Mine in Fergus County, Montana to examine the concentrations and distributions of residual cyanide species and associated metals in ore and pore water in a spent ore heap 30 months after neutralization. This has not been thoroughly investigated, despite the expanding use of heap leach cyanide in the past 25 years. Montana state regulatory authorities are also interested in the fate of cyanide and metals in neutralized heaps because of increasing closure and reclamation activities. This project has been completed.

2. Montana Bureau of Mines and Geology; Land Application of Cyanide Leach Solutions

MBMG evaluated whether oxidizing residual cyanide is an adequate method of protecting the environment from potentially toxic metals. This project has been completed.

3. Montana Salinity Control Association (MSCA); Salinity Control: A Nonpoint Source Pollution Management Program

MSCA continued to work on reclamation of saline seep areas in Montana. This project, which included fieldwork and planning on 50 new sites has been completed.

4. Montana Department of Health and Environmental Sciences (DHES)/Solid and Hazardous Waste Bureau; Pesticide Contamination Cleanup in Montana

This project involves the investigation and cleanup of pesticide-contaminated sites in, or adjacent to, three rural airports and two weed control districts. This project consists of four phases: site investigation, feasibility/treatability study, risk assessment, and cleanup plan development/execution. The site investigation and feasibility/treatability study have been completed and, the risk assessment is expected to be finalized by December 1994. Cleanup is scheduled for late FY 1995. Funds from a 1991 grant will also be used for pesticide contamination cleanup.

5. Butte-Silver Bow; Public Lands Reclamation Project

This project involved the removal of contaminated mine-waste fill materials located at local schools and parks. Seven sites were reclaimed including the World Museum of Mining, Arapaho Park, Lincoln School, Hebgen Park, Longfellow School, East Middle School, and J.F. Kennedy Park. Much of the originally proposed work was completed by volunteer labor resulting in a significantly lower cost than estimated. Private contributions for materials also exceeded original expectations. Of the \$120,800 in RDGP funding approved for this project, \$54,441 was unused.

6. Toole County; North Toole County Reclamation Project

This project was completed in January, 1993. It resulted in cleanup and reclamation of 22 abandoned oil and gas sites. Work included identification of candidate sites, disposal of oil contaminated soils, structure demolition and disposal, monitoring of groundwater quality, and revegetation.

7. Montana Bureau of Mines and Geology; Use of Natural Zeolites in Reducing Metal Concentrations at Mining Operations and Impacted Lands

The purpose of this project is to investigate the use of naturally occurring zeolites in tailings impoundments, disposal sites, and reclamation practices at sites contaminated with heavy-metals. The literature search and economic analysis portions of this project have been completed. Lab and field testing are under way.

8. Montana Department of Natural Resources and Conservation/Conservation Districts Bureau; Nonpoint Source Pollution Control in Montana

Projects are under way on Butcher Creek, Big Otter Creek, and Godfrey Creek. They demonstrate methods of controlling sedimentation from agriculture and channel modification. The public education component disseminates information on nonpoint pollution and methods of control.

### Projects Approved by the 1987 Legislature

1. Montana Department of Fish, Wildlife and Parks (DFWP); High Ore Creek Reclamation Project

The repair work to the channel and the gabion drop structure are continuing to function well. Surface areas that were disturbed to accomplish the repairs were reseeded fall, 1994 and an erosion control fabric was installed. All aspects of the construction activities are now completed. However, construction claims by the contractor remain unresolved. Negotiations between DFWP and the contractor continue. Additional extensions of spending authority from DNRC may be required.

2. Montana Department of State Lands (DSL); Nellie Grant Mine Reclamation

Cleanup at this site included removal and disposal of hazardous waste and asbestos, backfilling of mine shafts, structure demolition and disposal, regrading and revegetation, and establishment of a surface and groundwater monitoring plan. The work was completed over two construction seasons, with final acceptance during November, 1993. There is substantial work remaining at this site. The RDGP grant allowed for remediation of the most immediate threats to human health and the environment.

3. Butte-Silver Bow; Anselmo Mine Yard Reclamation Project

This project involved cleanup, renovation, and restoration of the Anselmo mine yard, buildings, and structures, which allowed the yard to become the central attraction of the Butte/Anaconda Historical Parks System. The work at the mine yard has been completed.

4. Montana Department of Natural Resources and Conservation; Sodium and Salinity Sources in the Powder River Basin--A Chemical-Budget, Modeling Approach

The objectives of this project were to (1) expand the Powder River water quality database by compiling existing data and collecting new data, (2) analyze variability and trends in water quality, (3) develop a water quality model capable of simulating monthly streamflow and dissolved solids loading, and (4) evaluate the effects of various management scenarios on water quality of the Powder River. This project has been completed.

5. Montana Department of State Lands; Drill Hole Reclamation in Montana--Hole Plugging Trials Utilizing Bentonite

The purpose of this project was to field-test several different drill hole abandonment materials and a variety of abandonment technologies applicable to Montana exploration activities. The project has been successfully completed. The individual case studies and research results can be found in the Montana Bureau of Mines and Geology open file report MBMG 266 A-F.

6. Montana Bureau of Mines and Geology (MBMG); Groundwater Information Center--Deep Aquifer Databases

MBMG has developed an electronic database of the geology and water quality of deep aquifers. Between 500 and 800 water quality analyses were added to the database. Formation-top data was entered to the database for deep aquifers in eastern Montana, and dissolved solids maps and latitude of formation maps for the Kootenai Formation and Judith River Formation were generated. These maps were placed on open file to demonstrate the accessibility and utility of the deep aquifer water quality information and formation-top information. This project has been completed.

7. Montana Bureau of Mines and Geology (MBMG); Low Grade Bentonite for Shot Hole Plugging

The purpose of this project was to field-test several different drill hole abandonment materials and a variety of abandonment technologies applicable to Montana exploration activities. The project has been successfully completed. The individual case studies and research results can be found in the Montana Bureau of Mines and Geology open file report MBMG 266 A-F.



Table 2  
RECLAMATION AND DEVELOPMENT GRANTS PROGRAM  
Funding Information for Projects Completed During the 1995 Biennium and Active Projects  
(Based on cash balances for October 21, 1994)

PROJECT SPONSOR / PROJECT TITLE	APPROPRIATED AMOUNT	CONTRACTED AMOUNT	AMOUNT DISBURSED
<b>1993 LEGISLATURE (53rd SESSION) -- HOUSE BILL NO. 7</b>			
BOARD OF OIL AND GAS CONSERVATION -- Kevin--Sunburst Plugging and Reclamation	\$299,000	(not contracted)	\$0
BOARD OF OIL AND GAS CONSERVATION -- Cat Creek Plugging and Reclamation	214,810	\$214,810	96
L.T. GOVERNOR'S OFFICE -- The Montana Office of Public Policy Dispute Resolution	127,667	127,667	92,159
WALKERVILLE, TOWN OF-- Walkerville Reclamation Project	50,000	50,000	44,956
BROADWATER CD -- Whites Gulch Placer Mine Reclamation Project	296,300	296,300	31,640
TOOLE COUNTY -- North Toole County Oil Field Reclamation Project	273,284	273,284	196,056
DFWP -- Elk Creek Placer Mined Channel Restoration	72,850	72,850	10,115
COLUMBUS, TOWN OF-- Waste Stream Reduction -- Oil Recycling	41,172	(not contracted)	0
CARBON CD -- RC&D's Affecting Change Through Local Leadership	300,000	300,000	24,116
DHES -- Nonpoint Source Pollution Control	300,000	(not contracted)	0
MBMG -- Acid Mine Drainage, Prevention, Control, & Treatment Technology	148,623	148,623	2,576
DEER LODGE VALLEY CD -- Develop Metal Tolerant Cultivars for Mine Reclamation	120,000	120,000	0
<b>TOTALS</b>	<b>2,243,706</b>	<b>1,603,534</b>	<b>401,714</b>
<b>1991 LEGISLATURE (52nd SESSION) -- HOUSE BILL NO. 8</b>			
BUTTE-SILVER BOW -- Water Air, Soils Testing and Evaluation Center (WASTEC)	296,113	296,113	285,137
CHINOOK IRRIGATION DISTRICT-- Milk River Water Supply, Rehab. & Betterment	300,000	300,000	0
JUDITH BASIN CD -- Community-Led Rural Development	170,000	170,000	111,341
DHES/CENTRAL MT HEALTH DIST -- Arroyo Refinery Sludge Cleanup	300,000	300,000	300,000
BOARD OF OIL AND GAS CONSERVATION -- Abandoned Well Plugging Project "A"	300,000	300,000	210,725
BOARD OF OIL AND GAS CONSERVATION -- Abandoned Well Plugging Project "B"	245,000	245,000	176,433
MT SALINITY CONTROL ASSOCIATION -- Soil & Water Nonpoint Source Pollution	137,500	137,500	40,064
MSU/RECLAMATION RESEARCH -- Effect of Sodium, Chlorine and Total Salts	82,885	82,885	32,680
CARBON, STILLWATER CO. & BIG TIMBER -- Integrated Waste Management	45,437	45,437	44,177
DHES/WATER QUALITY DIVISION -- Nonpoint Pollution Control Projects	146,620	146,620	55,716
MBMG -- Downhole Geophysical Logging Techniques	39,749	39,749	20,967

BOARD OF OIL AND GAS CONSERVATION -- Abandoned Well Plugging Project "C"  
 TOOLE COUNTY -- North Toole County Reclamation Project  
 CARBON, CHOUTEAU, CUSTER, DAWSON, LAKE CO.'s -- Pesticide Cleanup  
 BUTTE-SILVER BOW -- Upper Clark Fork River Basin Coordinator  
 DNRC/WATER MANAGEMENT-- Arsenic In Upper Missouri River Basin  
 DSL-- Well Assessment and Abandonment

144,000	144,000	44,568
105,000	105,000	105,000
300,000	(not contracted)	
60,000	60,000	41,518
179,330	179,330	44,013
300,000	300,000	244,150
3,151,634	2,851,634	1,756,489

TOTALS

**1989 LEGISLATURE (51st SESSION) -- HOUSE BILL NO. 776**

MSU/RRU -- Fate of Cyanides in Soils and Heap-Leach Pads  
 MBMG -- Land Application of Cyanide Leach Solutions  
 MT SALINITY CONTROL ASSOCIATION -- Salinity Control: Nonpoint Source  
 DHES -- Pesticide Contamination Clean-up  
 BUTTE-SILVERBOW GOV.-- Public Lands Reclamation Project  
 TOOLE CO -- North Toole Co. Reclamation Project  
 MBMG -- Use of Natural Zeolites in Reducing Heavy Metal  
 DNRC/CDD -- Nonpoint Source Pollution Control

140,243	140,243	122,554
91,161	91,161	45,401
200,000	200,000	200,000
150,000	150,000	137,920
120,800	120,800	66,359
299,040	299,040	299,040
149,238	149,238	85,996
262,573	262,573	119,364
1,413,055	1,413,055	1,076,633

TOTALS

**1987 LEGISLATURE (50th SESSION) -- HOUSE BILL NO. 6**

DFWP -- High Ore Creek Reclamation Project  
 DSL -- Nellie Grant Mine Reclamation  
 BUTTE-SILVER BOW GOV.-- Anselmo Mine Yard Reclamation Project  
 DNRC, WATER MANAGEMENT-- Sodium and Salinity Sources in Powder River Basin  
 DSL-- Drill Hole Reclamation, Hole Plugging Trials/Bentonite  
 MBMG -- Groundwater Information Center  
 MBMG -- Low Grade Bentonite for Shot Hole Plugging

198,600	188,436	148,754
84,900	84,900	84,896
150,000	150,000	147,634
89,257	89,257	89,257
100,000	100,000	90,889
155,950	155,950	155,950
45,890	45,890	45,752
824,597	814,433	763,132

TOTALS









# Report to the Legislature

January 1995  
Department of Natural Resources and Conservation



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